Colección Estudios, 5

# TELL EL-GHABA II

## A Saite Settlement in North Sinai, Egypt (Argentine Archaeological Mission, 1995-2004)

**Edited by Perla Fuscaldo**
**Editorial Assistance: Silvia Lupo**

**Introduction**
**Studies**

**Consejo Nacional de Investigaciones Científicas y Técnicas**
**Instituto Multidisciplinario de Historia y Ciencias Humanas**
**Departamento de Egiptología**
**Saavedra 15, 5º, Buenos Aires (C1083), Argentina**
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# TELL EL-GHABA II

## Introduction

**by Perla Fuscaldo**

# INTRODUCTION

**by Perla Fuscaldo**

Between 1995 and 2002 the Argentine Archaeological Mission worked at Tell el-Ghaba, North Sinai, Egypt, in the frame of the "Archaeological Salvage Project of the Monuments in North Sinai", as a joint project involving the former *Programa de Estudios de Egiptología* (now the Department of Egyptology, of the National Scientific Council (CONICET-Buenos Aires) and the School of Philosophy and Letters (Facultad de Filosofía y Letras), University of Buenos Aires (UBA).

Tell el-Ghaba was located at 30° 58' N. and 32° 25' E., between Tell Hebwa to the west and Tell Kedwa to the east, at the edge of the eastern part of a lagoon, near the former Pelusiac branch of the Nile. The fieldwork and the geophysical survey showed that the site had at least an extension of 12 Ha, 500 m long and 250 m wide (Plan I).[1] The Egyptian pottery from Tell el-Ghaba corresponds to the Phase IV North, the imported one to the Iron Age IIC and Cypro-Archaic I (IV). The pottery, used as the main chronological indicator, dates Tell el-Ghaba as an early Saite settlement, from the beginning of the 26th Dynasty, in the second part of the reign of Psametichus I, until the beginning of that of Psametichus II.

The first one of the main publication, *Tell el-Ghaba I: A Saite Settlement in North Sinai, Egypt (Argentine Archaeological Mission, 1995-2004)* appeared last year.[2] It included the Catalogue with the stratigraphy and the recovered archaeological material from three areas, Area I, Area II and Area VI.

The second volume, *Tell el-Ghaba II,* concerns the studies on the material found between 1995 and 1999. Not all the studies could be incorporated in this volume, but they will be published in the next one. The *Studies* comprise "The Geophysical Survey of the Site. Methodology and Results" by Jorge Trench, "Non-local Pottery Fabrics from Tell el-Ghaba. A Preliminary Classification" by Beatriz Cremonte, "The Last Days of Tell el-Ghaba: The Ceramic Evidence". "I.- The Egyptian Pottery", by Silvia Lupo; "II.- The Imported Pottery", by Susana T. Basílico, "Fishes from Tell el-Ghaba" by Alberto Cione, and "Fishing Techniques at Tell el-Ghaba" by Claudia Kohen and Alberto Cione. As a complement Claudia Kohen and Adriana Chavin publish a group of vessels, found partially uncovered in a dune and out of stratigraphic context ("A Vessel Deposit from Tell el-Ghaba").

The articles that appeared after the publication of *Tell el-Ghaba I* are listed below, in **Reports prior to this publication.**

In the **Addenda to Tell el-Ghaba I,** the archaeological material from five loci not included in that volume is published here (L0112, L0370 and L0375 north-eastern section, from Area I, Level I: Strata below Building A and Structure G; L0548, from Area VI, Level I: Pre-Building F, and L0505, from Level III: Post-Building F). A short description of each locus was quoted by the editor from the description made by Eduardo Crivelli Montero in volume I.

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[1] Plan of Tell el-Ghaba showing the areas excavated and surveyed by the Argentine Archaeological Mission, 1995-1999. Topographic plan by Antonio Balogh-Kovács (1995-1996) and Marta Búcola (1998); Autocad version by Susana Basílico.

[2] Perla Fuscaldo, ed., *Tell el-Ghaba I. A Saite Settlement in North Sinai, Egypt (Argentine Archaeological Mission, 1995-2004).* (Consejo Nacional de Investigaciones Científicas y Técnicas, Instituto Multidisciplinario de Historia y Ciencias Humanas, Departamento de Egiptología, Buenos Aires, 2005, Colección Estudios, 5). CD version.

## Reports prior to this publication

**2006**

1. Arbolave, G., "La preservación del patrimonio de Tell el-Ghaba. Criterios de guarda", in S. Basílico and S. Lupo (eds.), *Tell el-Ghaba, norte de Sinaí, Egipto. Alimentación, producción e intercambio* (Buenos Aires), 133-139.

2. Basílico, S. y S. Lupo, "Las relaciones de intercambio de Tell el-Ghaba con las áreas locales y con el Mediterráneo Oriental", in S. Basílico y S. Lupo (eds.), *Tell el-Ghaba, norte de Sinaí, Egipto. Alimentación, producción e intercambio* (Buenos Aires), 33-52.

3. Basílico, S. y S. Lupo, "Tell el-Ghaba. Los contextos del Área II", in S. Basílico y S. Lupo (eds.), *Tell el-Ghaba, norte de Sinaí, Egipto. Alimentación, producción e intercambio* (Buenos Aires), 73-98.

4. Cione, A., "Tell el-Ghaba, un sitio con abundantes peces marinos en el Egipto dinástico, in S. Basílico y S. Lupo (eds.), *Tell el-Ghaba, norte de Sinaí, Egipto. Alimentación, producción e intercambio* (Buenos Aires), 51-72.

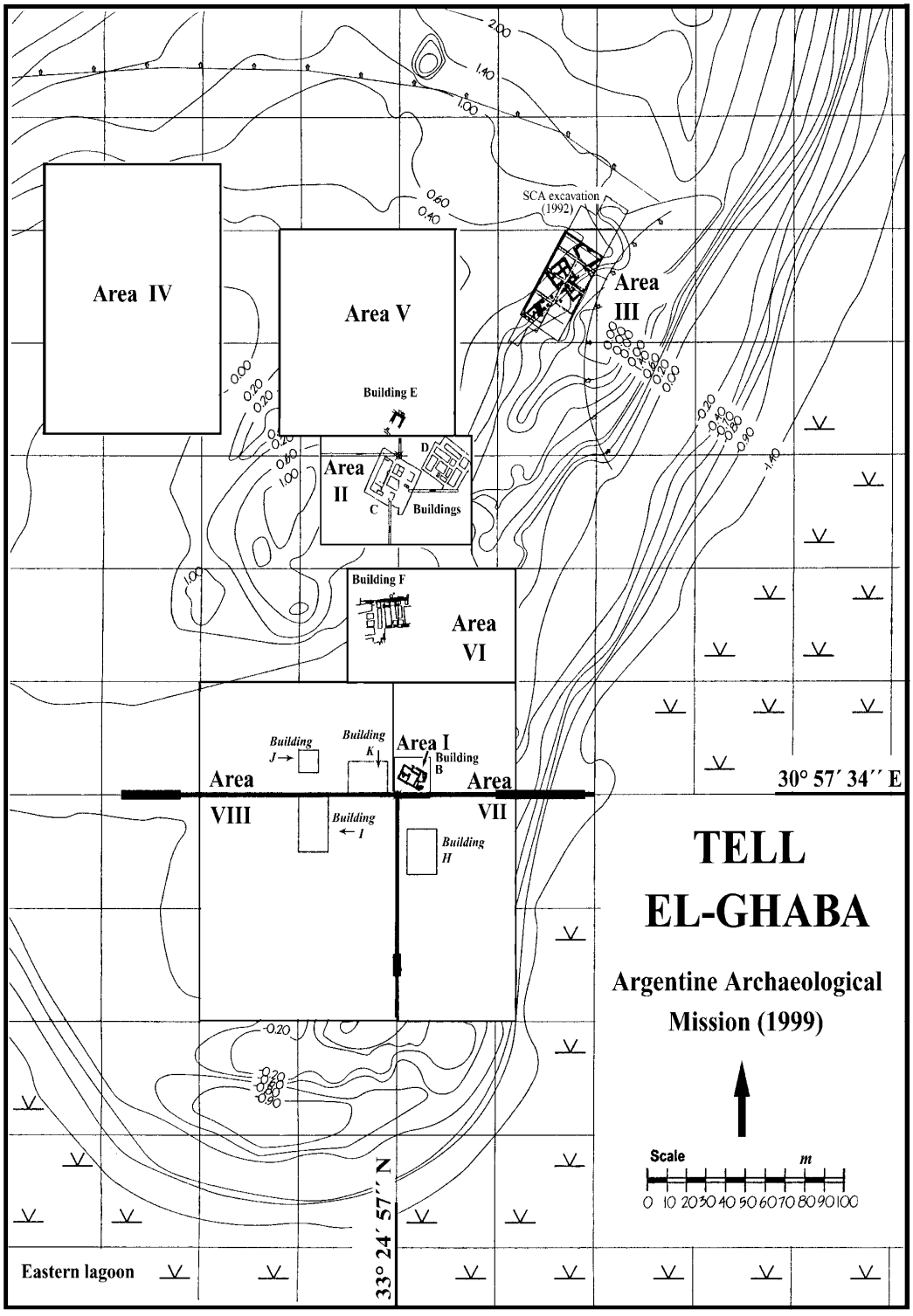
5. Cremonte, B., "Cerámicas no locales a través de sus pastas en Tell el-Ghaba, norte de Sinaí", in S. Basílico y S. Lupo (eds.), *Tell el-Ghaba, norte de Sinaí, Egipto. Alimentación, producción e intercambio* (Buenos Aires), 99-112.

6. Crivelli, E., "El extremo oriental del Delta en el pasado y en la actualidad", in S. Basílico y S. Lupo (eds.), *Tell el-Ghaba, norte de Sinaí, Egipto. Alimentación, producción e intercambio* (Buenos Aires), 11-32.

7. Fuscaldo, P., "The Egyptian Painted Wares from Tell el-Ghaba, North Sinai (early 26$^{th}$ Dynasty)", in E. Czerny, I. Hein, H. Hunger, D. Malman and A. Schwab (eds.), *Timelines. Studies in Honour of Manfred Bietak,* Leuven (Orientalia Lovaniensia Analecta 149), vol. II, 111-118.

8. Kohen, C., "La presencia de pesas de telar en Tell el-Ghaba: conjeturas sobre la manufactura de textiles en un sitio del norte del Sinaí durante la época tardía", in S. Basílico y S. Lupo (eds.), *Tell el-Ghaba, norte de Sinaí, Egipto. Alimentación, producción e intercambio* (Buenos Aires), 113-132.

**Plan of Tell el-Ghaba showing the areas excavated and surveyed by the Argentine Archaeological Mission (1995-1999)**




Plan I

# TELL EL-GHABA II

## Studies

**The Site**
**The Pottery**
**Fauna**

# The Site

## The Geophysical Survey of the Site. Methodology and Results*

**by Jorge Trench†**

**Abstract**

A brief description about the activities performed at designated sites, including equipment description plus results obtained.

## Introduction

The archeological use of geomagnetism is based on the fact that archeological deposits can be seen as anomalies in the uniform magnetic field of most soils. All soils have a particular value of magnetic susceptibility; additions with a different susceptibility, such as stone foundations, walls, a hole filled with organic material, can be detected and registered. The easiest to identify are intrusions with magnetic potential, such as magnetic metals, or floors under fires where the heat has created magnetism. The technique utilized to identify these intrusions is to measure the intensity of the earth's magnetic field in a given spot and then compare this value with the one obtained in its vicinity. In Tell el-Ghaba we know that the walls are made of adobe mixed with shells, so one expects that they will have a magnetic susceptibility somewhat different from the one in the surroundings. It is possible that the susceptibility is less, creating depressions in the field of about 2 or 3 nanoTeslas. We also expect to find the foundations below ovens which typically have a slightly higher susceptibility and are therefore visible due to this thermoresidual magnetism. We expect to find holes filled with organic debris with a higher susceptibility than the surrounding soil. The areas excavated between 1995 and 1997 and their surroundings will allow us to make the preliminary trials necessary to define magnetic signatures and then use them in the rest of the not-yet-excavated archeological site.

## Survey technique employed

During October 1998 and 1999 a magnetic survey of the Tell el-Ghaba site was conducted by Jorge Trench, from the Argentine Archaeological Mission. The geophysical work was accomplished with a team of people and two main instruments, a *geoscan gradiometer flux-gate type FM18* and a versatile and programmable *resistance meter RM15 with multiplexer* from the same manufacturer.

Before starting the geophysical survey it was necessary to mark again topographically the field into the original magnetic survey points, work already done in a previous campaign. This task became a mayor survey effort due to the disappearance of many of the marking points in the areas of interest. Therefore we proceeded to restore many of the previous 50-meter reticulates, as they appeared in our previous map of the concession field. After this initial task was completed, specific areas were marked into 30 by 30 meters square grids, suitable to make use of our survey lines of these lengths. Each square made use of three

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**Note of the editor**

* Jorge Trench died of a heart attack in 2001 He had already finished this article, partially presented at the Supreme Council of Antiquities, Egypt, with the yearly report of the archaeological campaign, except the introduction that was translated to English by Elsa Rosenvasser Feher; the files were prepared for publication by Tomasz Herbich. To both on them I give thanks for their cooperation.

guidelines, which included a mark each meter. In this way we programmed our surveys by specifying the number of samples per meter and the traverse interval. The surveys conducted with the gradiometer needed the adjustment of the instrument to make it insensitive to direction, and needed to have the zero setting recalibrated before and after each grid survey. A special encased wood stand was made to ease this adjustment operation in the field. The clothing of the operator was specially controlled; to be sure he did not transport any residual magnetic material in his body. This was a matter of special concern.

## The survey done during the 1998 campaign

In accordance with previous programming we designated several particular areas for exploration during this campaign. The designated areas are marked at Plan I with corresponding numbers. The surveys planned started with the intensive use of the gradiometer, followed in a final instance by the use of the resistance meter. Crude data obtained in the field was immediately loaded into a portable computer via RS232C serial link. Each data set was called a grid, and later several of these grids from the same area were arranged in a composite view, with processing capabilities such as low-pass filtering, de-spiking and elimination of huge anomalies of known sources with no archaeological value such as scattered pieces of iron and decaying barbed wire, that plagued several parts of the scene of study.

## Description of surveys performed

### a) Gradiometry

The first survey using the magnetic gradiometer was performed in Area IV (Plan I) with twelve grids traversed, at one sample per meter and 1 nanoTesla sensitivity, 1-meter traverse interval and zigzag mode. A composite, made with the grids of this area, did not show any important geomagnetic anomaly that could be attributed to an archaeological origin. Some localised anomalies were attributed to modern iron debris. This survey was completed on October 17$^{th}$, during a very hot day that obliged us to zero the instrument very frequently.

After finishing the survey of this first area we moved our guide lines to a second site, namely Area V (Plan I). Several preliminary surveys made on this specific area moved us to change and increase the sensitivity to 0.1 nanoTesla and increase the number to 2 samples per meter. The traverses were performed in a parallel mode instead of the previous zigzag mode. All these changes had the objective of improving the quality of the survey. Moreover, a precise recalibration and zero-setting were standardised for all the following surveys performed during our work. Finally, data on area V was registered as two grids 20 by 20, 2 samples per meter parallel mode. A composite allowed us to identify two sub areas of archaeological interest, possibly hearths. A further archaeological test confirmed this assumption.

The survey work continued in Area VI (Plan I). This area had been intensively studied, therefore we made several intents to sweep the area more closely to enhance the specific features. A preliminary survey done a 0.1 nanoTesla and four samples per meter using grids 30 by 30 and zigzag gave us the rewarding result of detecting the presence at least of two buildings, one of them (named Building F) with a reticular interior design, and with a remarkable magnetic orientation north-south. Six grids were sufficient to cover an extended area that included the mentioned features observable in a composite. After these enjoyable preliminary survey results we performed additional surveys. To illustrate the best result obtained a composite in Plate I. Made with 3 grids 20 by 20, 0.1 nanoTesla, 2 samples per meter parallel mode. In situ inspection by test excavation followed by solid confirmation of the discovery of a new building (Building F) gave us confidence about the reliability of making predictions with this geophysical survey method.

A final geomagnetic survey was performed at Area I (Plan I) beside an open site. One grid 20 by 20 and the same standardised parameters as the before, depicted the appearance of possibly 3 hearths. No archaeological inspection was done at this single grid site.

## Resistivity surveys

We used the geoscan RM15 resistivity meter with multiplexer and the PA5 array of electrodes. The resistivity technique allows us to do a different type of geophysical probing.

It consists mainly of injecting an alternating electrical current with two current electrodes, and measuring the voltage drop using another pair of electrodes (voltage electrodes). Many different configurations of electrodes have been used since the introduction of this survey technique, several decades ago. They received specific names according to their spatial distribution and the method of survey. Two particular configurations were selected to study the feasibility of this technique and the response of our site to this type of probing. Therefore for our survey we selected the so-called Twin probe and Wenner method in its line mode and area mode. The test selected comprised the study of several grids already studied by magnetic gradiometry. The first study, in Wenner, line mode, was performed near the Area I, 3 consecutive lines of 30 meter length in the south direction, 4 lines towards the west and 3 lines in the south direction. Three graphs gave us indication of the resistance variability of the site. Further studies using this fast survey technique will be planned for next year. Area survey was performed in Area I, using twin pole and Wenner array. A composite was printed showing zones of high resistivity concentration; they need now to be correlated with excavation within the specific site. As a general conclusion about the geophysical exploration performed during this campaign, we can say that the magnetic gradiometer proved to be a valuable tool to obtain information about the existence of adobe bricks ceramic deposits. The resistivity results are still preliminary and need to be correlated with archaeological excavations.

## The survey done during the 1999 campaign

For the second geophysical campaign, the geoscan FM18 magnetic gradiometer was used in the survey. An extensive survey area was selected in the present campaign, as a continuation of the previous survey (1998) and to cover an unexplored area located in the central and southern part of the site (Areas VII and VIII, Plan I). This new survey was centred approximately in the place previously designated as Area I. Forty square grids of 20m by 20m were measured using an automatic optical level and a metric ribbon, following the topographical –magnetic map previously made by the Mission. Each grid was surveyed using a high resolution mode, namely doing parallel traverses, each one with half a meter spacing and registering two averaged data samples per meter. In this way 1600 data points per grid were produced with the geoscan FM18 gradiometer. Every two grids, the accumulated data was dumped into the portable notebook computer.

The data files obtained were composed into a single map, after suitable data processing, like de-spiking, interpolation in both directions and low-pass filtering. A high-resolution single map of the surveyed area was produced with a clip parameter of plus and minus 3 nanoTeslas.

## Analysis of the results

We clearly found the location of five new buildings of size approximately one grid each. Some other observed features indicate the presence of another three building sites, partially covered by dunes or excavated material. In general the new buildings show a good signal to noise contrast, adequate to reveal existence of their internal structure. The plot also suggests, with faint lines, the existence of other possible occupation areas. We could also observe patterns that indicate the use of heavy equipment for sand removal. At both sides of

the central part a decrease of magnetic activity shows clearly that the main occupation area resides in the central part of the plot. Exploration trenches were open in three of the new sites indicating the existence of mud bricks. Marks were left in the site for future surveys toward the southeastern part of the site. This extensive area surveyed and high resolution employed gave good results that compensate the strenuous physical effort involved in this kind of field work (Plates II and III).

## Sondages subsequent to geomagnetic surveying

After the geomagnetic surveying, test pits were dug by the team of archaeologists in different parts of the surveyed areas and mud brick walls very close to the surface were found. These structures were identified as follows:

| Buildings | Square of test pit |
|---|---|
| H | BA/38 |
| I | AQ/40 |
| J | AQ/44 |

Another possible structure (which would be Structure K) lies in square AY/41; but no test pit was dug here.

## List of Plates

**Plate I**: Geophysical survey in Area VI (Building F), 1998. Composite made with 3 grids 20 m by 20 m, 0.1 nT, two samples per meter parallel mode (high pass filter; file prepared for publication by Tomasz Herbich, 2004).

**Plate II**: Geophysical survey in Areas VII and VIII, 1999. Sampling grid 0.5 m by 0.5 m. interpolated to 0.25 m by 0.25 m. High pass filter. Dynamics -10 / +10 nT (file prepared for publication by Tomasz Herbich, 2004).

**Plate III**: Geophysical survey in Areas VII and VIII, 1999. Sampling grid 0.5 m by 0.5 m. interpolated to 0.25 m by 0.25 m. High pass filter. Dynamics -5 / +5 nT (file prepared for publication by Tomasz Herbich, 2004).

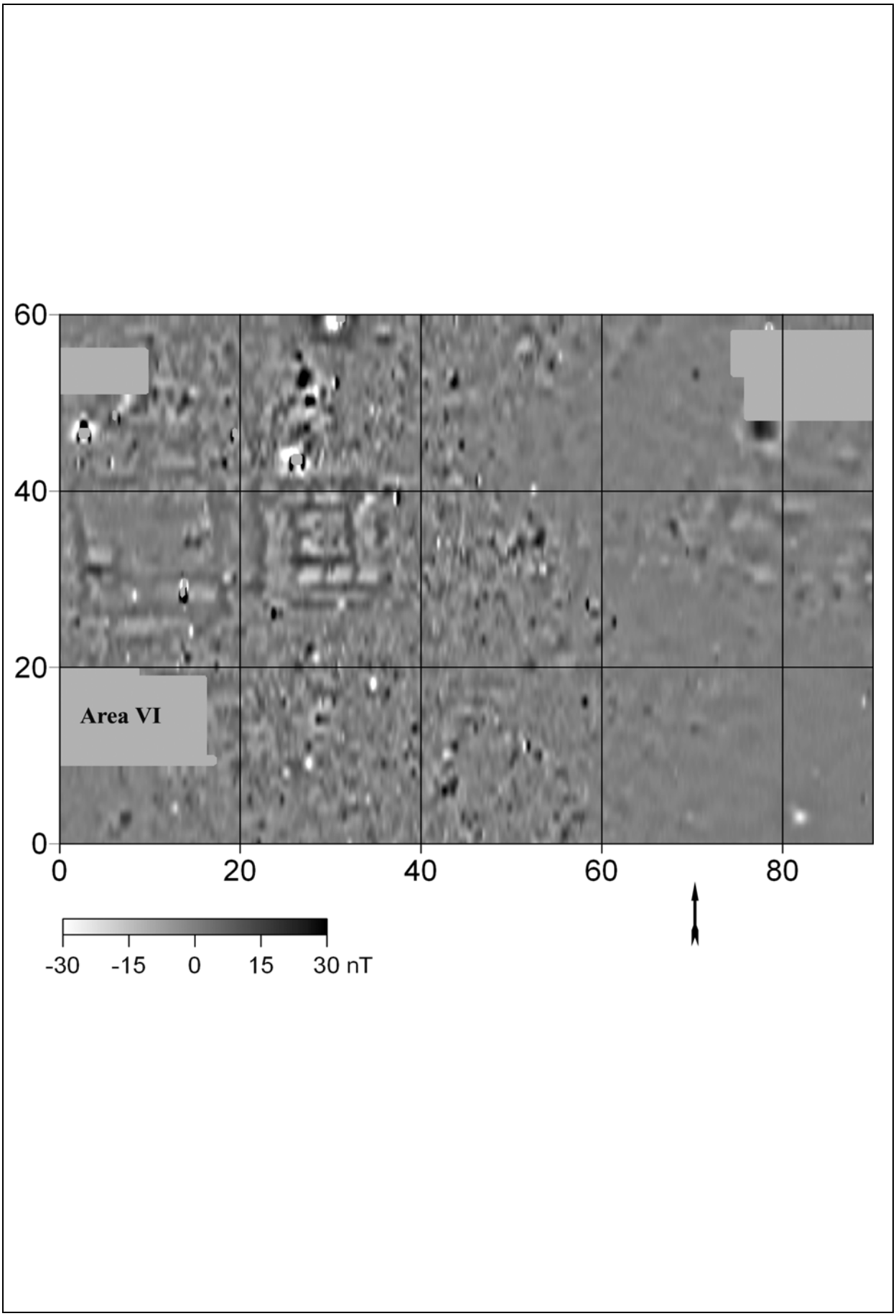


**Plate I:** Area VI, Building F

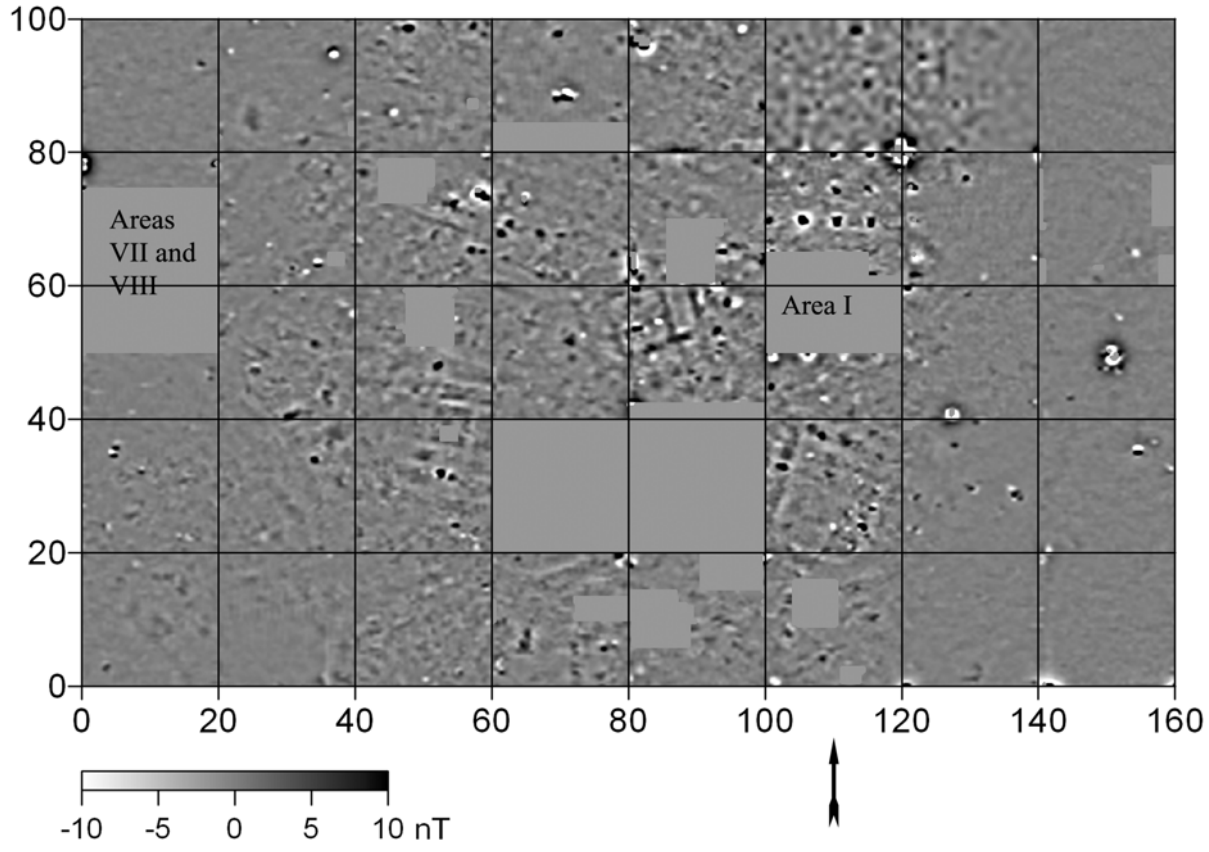


**Plate II:** Areas I, VII and VIII a

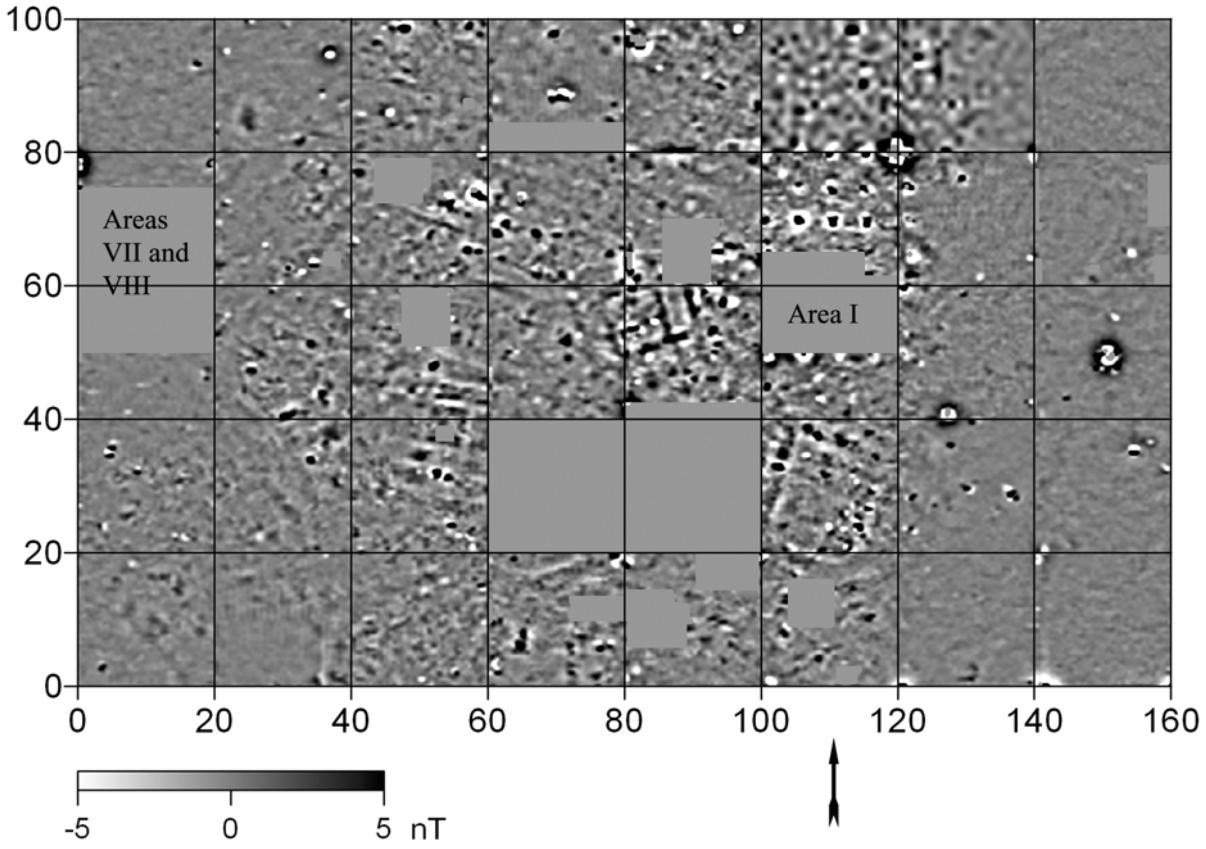


**Plate III:** Areas I, VII and VIII b

# TELL EL-GHABA II

## Studies

### The Pottery

# Non-local Pottery Fabrics from Tell el-Ghaba. A Preliminary Classification

**by María Beatriz Cremonte (CONICET-UNJu)**

**Abstract**

In this paper a preliminary characterization of Tell el-Ghaba pottery fabric types identified in binocular microscope with petrographic additional information are presented. From de analysis of thousands of sherds 46 fabric groups were assigned as non-local vessels (mainly II.Sinai or South Palestine; IV.Levantine; VI.Cypriote and VII.Aegean) taking this hypothesis as a starting point in the study of Tell el–Ghaba pottery production, consumption and commercial and social interactions along its history. On the other hand the abundance of apparent imported vessels with local Marl F fabrics suggests the imitation of foreign styles, one aspect that proves the importance of fabric studies in ceramic typologies.

## Introduction

Tell el-Ghaba shows an important number and diversity of non-local vessels, which reflect social interactions specially with Eastern Mediterranean societies, so as commercial ties with Upper Egypt. The goal of this paper is to present a preliminary characterization of the fabric types identified at the moment and the methodology applied for the analysis. Complete covariations among fabrics, morphologies and decorations are presented in volume I (*Catalogue*),[1] so as their provenience areas and the containers uses.

Up to now almost 6.000 sherds were analysed in binocular microscope in order to identified and /or characterized non local manufactures. Nile silt clay and Egyptian marls fabrics are not included in this study, because they were classified according to the "Vienna System".[2] On the other hand, in most of the descriptions concerning to each fabric group brief petrological characterizations of thin sections was added.[3]

It is known that binocular microscope analytic technique is a first level in fabric studies[4] by mean of which a great number of sherds may be registered for a base classification covering the whole variation of hardness, fracture, porosity and inclusions (granulometry, shapes, frequency, distribution, and main mineralogical types). Although its limitations in clay texture observation and precise mineralogical identification, this strategy complemented with further thin sections analysis give valuable information about broad themes:

1. The technology of manufacturing process;
2. The physical characterization of the final product;
3. Its provenance.[5]

Furthermore the incorporation of fabric analysis in morphological and stylistic typologies enhances our knowledge about pottery, in relation to local *versus* non-local production, distribution and trade nets. In regards of this point of view, as preliminary results fabrics which share similar characteristics were grouped and some statements concerning the provenience of the vessels are argued.

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**Notes**

[1] P. Fuscaldo (ed.), Tell el-Ghaba I. A Saite Settlement in North Sinai, Egypt (Argentine Archaeological Mission, 1995-2004), 2005, p. 23 ff.

[2] Aston, *Egyptian Pottery,* 1-9.

[3] Freestone, in Midleton. and Freestone (eds.), *Recent Developments in Ceramic Petrology*, 403.

[4] Orton, Tyers and Vince, *Pottery Archaeology,* 133.

[5] Bishop, Rands and Holley, in Schiffer (ed.), *Advances in Archaeological Method and Theory,* 5, 275-330.

## Methodology

Fabrics were analysed in binocular microscope (10x–80x). According to the characteristics of the pottery universe a *Register File* for thirteen attributes and their states was designed.

Five attributes are referred to the general aspect of each sherd:

1. Wall thickness.
2. Surfaces colour (according to the Munsell colour chart).[6]
3. Surfaces treatment: smoothing, burnishing, polishing, throwing marks, and presence of non-plastic inclusions.
4. Decoration: painted, modelled, slipped (Munsell).
5. Hardness (according to the modified Mohs scale) considering as: soft (2), medium hard (2-3), hard (3-4) and very hard (>4).

The other eight attributes are referred to the following attributes in fresh break:

6. Fracture: regular, quite regular, irregular.
7. Colour (Munsell): fabric colour was indicated in a section schematic draw.
8. Firing: completely oxidized, partially oxidized, reduced, based in fresh break colour.

The non-plastic inclusions were classified according to:

9. Types, granulometry and abundance.

9.1. Types**:** sand, mica, limestone, ochre, minerals or fragments of rocks identified by colour (black, grey, brown, reddish, whitish, etc), so as evidences of straw, chaff, forams or shell, grog, clay nodules, others.

9.2. Granulometry: fine (0.06 – 0.25 mm); medium (>0.25 – 0.50 mm); coarse (>0.50 – 2 mm), very coarse (>2 mm).

9.3. Abundance: scarce [1], medium [2], dense [3].

We considered as sand the translucent particles (mainly quartz) and those without a mineralogical identification were named by their colours: black, brown, red, etc.[7] As ochre we considered those orange or brownish orange quite soft inclusions (although sometimes the difference to grog is not clear in binocular microscope).

10. Distribution (uniform/non uniform) and frequency (%) by visual comparison with the Munsell "Charts for estimating proportions of mottles and coarse fragments".
11. Shapes of non-plastic inclusions: angular, tabular, rounded, sub-rounded, sub-angular (based on sphericity /roundness estimation charts used in sedimentology).
12. Porosity:

12.1. Abundance: open, medium, dense.

12.2. Sizes: small (0.25 mm – 0.50 mm); medium (>0.50 mm – 2 mm), large (2 mm– 4 mm) and very large (>4 mm).

12.3. Shapes: rounded, elongated, elongated irregular.

13. Texture: as texture we considered the combination between inclusion granulometry (fine, medium, coarse) and matrix aspect (compact, laminar, porous).

Any other observation of interest was recorded and a general characterization that which allow the fabric quick identification is offered.

Based on the information included in the *Register files* a complete and standardized characterization for each fabric group was established. Photomicrographs (10 x) were added to them (Plate I ).

From a total of 62 groups 25% of them were reassigned as local fabrics. That is why in this preliminary non-local fabric classification, up to now forty six standards or groups are described in accordance to their original nomination. It is assumed that the number of

[6] *The Munsell Soil Color Chart* (1992)
[7] Bourriau and Nicholson, *JEA* 78, 29-91.

standards will be reduced by the incorporation of new samples and contrasting data with thin section analysis.

## Fabric description

**Group: TG 1** *Register file Nº 19*
Lab reference: Inv. No. P1189A[8] Final classification: **IV.TG 01**

Vessel shape: Bichrome jug or jar (body sherd). Wall thickness: 6 mm.
**Fabric:** medium hard (Mohs: 3) **-** quite regular break – high resistance. The break is light reddish brown (5YR 6/4) with two red (10R 5/6) thin layers below each surface. A brown line (vitrified?) near one of the surfaces.
***Inclusions***: *Ochre* [1] fine [1] coarse. *Sand* [2] fine. *Limestone* [2] fine, scarce medium and coarse ones. *Black particles* [1] fine. *Forams* [1] fine.
*Distribution:* uniform, small to medium rounded inclusions are the commonest, only a few large and angular limestone particles.
*Frequency:* ca. 20%.
***Porosity:*** medium. Small rounded pores and scarce elongated irregular voids.
**Texture and main characteristics:** fine and compact light reddish brown fabric with abundant quartz and limestone uniform inclusions. Firing: partially oxidized (Plate I:1).
**Comments**: Levantine fabric. Bichrome jars, coated and uncoated "torpedo" type amphorae, amphorae with a whitish slip (basket handle), White Painted bowls.
**Thin section**: clay mass (82 %) – quartz (9 %) – fragments of sedimentary rocks (8.70 %) – muscovite (0.20 %). Grain size: 15-60 μm (43 %), 60-100 μm (19 %), 100-200 μm (23 %), 200-400 μm (14 %), 400-1.000 μm (1 %). Estimated firing temperature: 750º C.

**Group: TG 3** *Register file Nº 12*
Lab reference: Inv. No. P1069A[9] Final classification: **IV.TG 03**

Vessel shape: "torpedo" type amphora (body sherd). Wall thickness: 8.5 mm.
**Fabric:** medium hard (Mohs: 3) - break – high resistance. The break is red (2.5 YR 5/8) with a reddish brown (5 YR 5/4) layer below the inner surface.
***Inclusions***: *Ochre* [1] fine to coarse. *Sand* [1] fine to medium, rounded and angular quartz. *Limestone* [1] fine [1] coarse and very coarse. *Black particles* [1] probably calcinated organic material. *Forams* [2].
*Distribution*: non uniform.
*Frequency*: ca. 20 %.
***Porosity****:* dense, small pores to large voids, elongated and irregular pores are the commonest.
**Texture and main characteristics:** fine**,** compact and porous fabric with vitreous quartz and abundant limestone and forams. Smoothed surfaces without slip, the inner pink (5YR 7/4), the outer surface is reddish yellow (5YR 6/6) (Plate I:2).
**Comments**: Levantine. The fabric colour may be dark reddish grey (2.5YR 4/1) with thin red (2.5YR 5/8) layers near both surfaces. Salts are common. Similar to TG 01. Coated juglets and coated and uncoated "torpedo" type amphorae.
**Thin section:** clay mass (85 %) – quartz (5.50 %) – fragments of sedimentary rocks (9.40 %) – muscovite (0.10 %). Grain size: 15-60 μm (50 %), 60-100 μm (18 %), 100-200 μm (25 %), 200-400 μm (6 %), 400-1.000 μm (1 %). Estimated firing temperature: 750º C.

[8] From Area II, Level II, L1102; in *Tell el-Ghaba I*, p. 225, **No. 19** and Fig. 11:1. Reference to *Tell el-Ghaba I* in this and the following notes made by the editor.
[9] From Area I, Level VI, L0001; in *Tell el-Ghaba I*, p. 174, **No. 259** and Fig. 40:22.

**Group: TG 4** *Register file Nº 7*
Lab reference: Inv. No. P0882A[10] Final classification: **VI.TG 04**

Vessel shape: amphora (rim and neck sherd). Wall thickness: 6.5 mm.
**Fabric:** soft (Mohs: 2) – regular break – low resistance. The break is very pale brown (10YR 7/4) with thick pink (5YR 7/4) core.
***Inclusions***: *Ochre* [1] fine to coarse, rounded and dark orange. *Sand* [1] fine. *Limestone* [1] small [1] medium to large. *Black particle*s [1] small. *Forams* [1].
*Distribution*: uniform, angular and rounded small and medium inclusions are the commonest.
*Frequency*: ca. 20 %.
***Porosity***: medium**,** tiny rounded pores and large to very large elongated voids.
**Texture and main characteristics:** fine and soft very pale brown fabric. The small limestone and the quartz inclusions are masked in the matrix, only the dark orange ochre contrasting. Smoothed surfaces very pale brown (10YR 7/3) (Plate I:18).
**Comments:** Cypriote quite frequent fabric used in a variety of wares (White Painted, Black-on-Red II (IV), Bichrome) and vessel shapes (amphorae, barrel-shaped jugs, jugs, bowls, jars, juglets and pots).
**Thin section:** clay mass (84 %) – quartz (3.90 %) – fragments of sedimentary rocks (12.10). Grain size: 15-60 µm (81 %), 60-100 µm (12 %), 100-200 µm (5 %), 400-1.000 µm (2 %). Estimated firing temperature: 750º C.

**Group: TG 5** *Register file Nº 8*
Lab reference: Inv. No. P1082A[11] Final classification: **IV.TG 05**

Vessel shape: juglet (body sherd and handle fragment). Wall thickness: 7 mm.
**Fabric:** hard (Mohs: 4) – regular break – high resistance. The break is red (7.5R 5/6) and weak red (5R 5/2) in two continuous layers.
***Inclusions***: *Ochre* [1] small. *Sand* [1] medium. *Limestone* [1] small [1] large. *Black particles* [1] small and medium. *Forams* [1].
*Distribution:* uniform, the commonest inclusions are small and medium, rounded. Angular inclusions are less common.
*Frequency*: 25 %.
***Porosity*:** open. Small and rounded pores.
**Texture and main characteristics:** medium and compact red fabric. Presence of vitreous and milky quartz and abundant limestone (only a few particles are coarse) contrasting in the matrix. Smoothed surfaces, probable whitish slip (Plate I:3).
**Comments:** Levantine. Infrequent fabric registered in uncoated jars and probably coated juglets.
**Thin section:** clay mass (83 %) – quartz (2.60 %) – fragments of sedimentary rocks (14.40 %). Grain size: 15-60 µm (61 %), 60-100 µm (19 %), 100-200 µm (13 %), 200-400 µm (7 %). Estimated firing temperature: 750º C.

**Group: TG 6** *Register file Nº 26*
Lab reference: Inv. No. P1280A[12] Final classification: **IV.TG 06**

Vessel shape: jar (ring-based jar). Wall thickness: 6.5 mm.
**Fabric:** medium hard (Mohs: 3), regular break, high resistance. The break is light reddish brown (5YR 6/4) with a thin layer reddish grey (5YR 5/2) below the outer surface.

[10] From Area I, Level V, L0171; see Addenda to this article, No. 8.
[11] From Area II, Level V, L1001; in *Tell el-Ghaba I*, p.329, **No. 77**.
[12] From Area II, Level I, L1060; in *Tell el-Ghaba I*, p.300, **No. 13** and Fig. 49:2.

***Inclusions***: *Ochre* [1] tiny. *Sand* [2] fine. *Limestone* [2] small and medium, rounded. *Black particles* [1] small**.** *Forams* [1] small.
*Distribution*: uniform.
*Frequency*: ca. 25 %.
***Porosity***: dense. Small and medium pores, rounded and elongated.
**Texture and main characteristics:** quite fine, compact and porous fabric with abundant quartz and limestone. Smooth surfaces without slip. The outer surface reddish grey (5YR 5/2) and the inner surface light reddish brown (5YR 5/4) (Plate I:4).
**Comments:** this fabric is rare, it may be considered a variety of IV.TG 05 (more porous and less compact).
**Thin section:** clay mass (80 %) – quartz (3.10 %) – plagioclase(0.20 %) - fragments of sedimentary rocks (16.70 %). Grain size: 15-60 µm (12 %), 60-100 µm (16 %), 100-200 µm (56 %), 200-400 µm (16 %). Estimated firing temperature: 800º C.

**Group: TG 7** *Register file Nº 1*
Lab reference: Inv. No. P0566A[13] Final classification: **IV.TG 07**

Vessel shape: "torpedo" type amphora (shoulder sherd). Wall thickness: 7.5 mm.
**Fabric:** hard (Mohs: 4) – regular break – high resistance. The break shows three layers: light yellowish brown (10YR 6/4) below the outer surface, grey (7.5YR 6/1) core and light reddish brown (5YR 6/4) below the inner surface.
***Inclusions***: *Ochre* [1] small and large. *Sand* [1] medium (vitreous quartz and reddish brown translucent particles). *Limestone* [2] small to large (oxidized edges). *Black particles* [1] medium. *Forams* [1]. *Mica* [1] probably muscovite. *Straw*: a large black and rectangular inclusion (4 mm) in the grey core.
*Distribution*: non uniform.
*Frequency*: ca. 20 %.
***Porosity:*** dense, the commonest pores are small to medium, rounded and elongated.
**Texture and main characteristics:** medium, compact and porous fabric with abundant rounded limestone inclusions. Scarce organic material and brown zones (vitrified?). Smoothed brown (7.5YR 4/2) surfaces without slip (Plate I:12).
**Comments:** Levantine. Some fabrics may be a little coarser. Uncoated "torpedo" type amphorae, uncoated pilgrim flasks and coated jugs.
**Thin section:** clay mass (83 %) – quartz (2.80 %) – plagioclase(0.20 %) - fragments of sedimentary rocks (10 %). Grain size: 15-60 µm (67 %), 60-100 µm (3 %), 100-200 µm (10 %), 200-400 µm (19 %), 400-1.000 µm (1 %). Estimated firing temperature: 750º C.

**Group: TG 8** *Register file Nº 22*
Lab reference: Inv. No. P0159A[14] Final classification: **II.TG 08**

Vessel shape: model amphora (handle sherd). Wall thickness: 6 mm.
**Fabric:** soft (Mohs: 2) - irregular break - low resistance. The break is pink (5YR 7/4) with very pale brown (10YR 7/3) layers below each surface.
***Inclusions***: *Ochre* [2] small to very large, rounded. *Sand* [2] fine and medium. *Black particles* [1] small. *Light brown particles* [1] tabular and thin.
D*istribution*: non uniform.
*Frequency*: ca. 20 %.
***Porosity***: dense. Small rounded pores and large elongated voids (straw?).

[13] From Area I, Level V, L0057; see Addenda, No. 4.
[14] From Area I, Level V, L0009; see Addenda, No. 1.

**Texture and main characteristics:** medium, sandy, porous and soft (talcose) fabric with abundant rounded ochre inclusions contrasting in the light matrix. Smoothed surfaces with probably light grey (10YR 7/2) slip, but no difference is seen between the surfaces and the fabric sections close to them (Plate I:26).
**Comments:** uncommon fabric similar to TG 9 and TG 10 Probable provenience: II. Sinai or South Palestine. Coated and uncoated juglets, uncoated bowls with flat base, uncoated jugs, uncoated amphorae and probably White Painted Ware.
**Thin section:** clay mass (85 %) – quartz (10.60 %) – K-feldspar (0.90 %) – plagioclase(2.40 %) – fragments of rocks: sedimentary (0.20 %) – magmatic rocks (0.60 %) – muscovite (0.10 %) – biotite (0.10 %) – heavy minerals (0.10 %). Grain size: 15-60 µm (75 %), 60-100 µm (10 %), 100-200 µm (12 %), 200-400 µm (2 %), 400-1.000 µm (1 %). Estimated firing temperature: 800º C.

**Group: TG 9** *Register file Nº 5*
Lab reference: Inv. No. P2006A[15] Final classification: **II.TG 09**

Vessel shape: amphora rim sherd. Wall thickness: 10 mm.
**Fabric:** soft (Mohs: 2) – regular break – low resistance. The break is light brownish grey (10YR 6/2) with very thin pink (7.5YR 7/4) layers below each surface.
***Inclusions***: *Ochre* [1] medium to very large. *Sand* [3] fine. *Black particles* [1] small. Some light brown large and rounded inclusions (clay nodules?). *Whitish particles* [1] fine, angular and tabular. *Organic material* [1] small, rounded, calcinnated.
*Distribution*: quite uniform.
*Frequency*: 10-20 %.
***Porosity***: dense, the elongated irregular voids are very common.
**Texture and main characteristics:** fine and very sandy fabric, soft and porous (talcose) with non-uniform ochre particles contrasting in the matrix. Smoothed pink (7.5YR 7/4) surfaced without slip or painting. Vessels with thinner walls are common (Plate I:27).
**Comments:** similar to II.TG 08 but more sandy and with less amount of ochre particles. A same provenience must be postulated. Probable coated and uncoated amphorae.
**Thin section:** clay mass (78 %) – quartz (21.50 %) – fragments of rocks: magmatic (0.20 %) – metamorphic (0.10 %) - muscovite (0.10 %). Grain size: 15-60 µm (80 %), 60-100 µm (13 %), 100-200 µm (4 %), 200-400 µm (3 %).Estimated firing temperature: 800º C. Presence of nodules of poorly mixed clay.

**Group: TG 10** *Register file Nº 27*
Lab reference: Inv. No. P1230A[16] Final classification: **II.TG 10**

Vessel shape: coated bowl (foot sherd). Wall thickness: 6.5 mm.
**Fabric:** soft (Mohs: 2) - regular break – low resistance. The break is pink (7.5YR 7/3) from the middle section to the outer surface, and pinkish grey (7.5YR 7/2) to the inner surface.
***Inclusions***: *Ochre* [1] small and rounded. *Sand* [3] fine to medium rounded vitreous and milky quartz. *Black particles* [1] small and rounded. *Whitish particles* [1] fine to large. Probable clay nodules and small rounded brown zones.
*Distribution*: uniform.
*Frequency*: 25 %.
***Porosity***: dense. Small and medium pores (rounded and elongated rounded) are very common, so as large and very large elongated irregular voids.

[15] From Area I, Level III, L0289; in *Tell el-Ghaba I*, p.82, **No. 26** and Fig. 13:2.
[16] From Area I, Level II, L0040; in *Tell el-Ghaba I*, p.62, **No. 59** and Fig.3:4.

**Texture and main characteristics:** fine, very sandy and porous fabric, crumbly. Smoothed pink surfaces (7.5YR 7/3) (Plate I:28).
**Comments:** TG 09 and TG 10 correspond to a same fabric type. Coated bowls and juglets, red coated jars, White Painted jars or juglets, Bichrome amphorae and uncoated amphorae with pointed base.
**Thin section:** clay mass (78 %) – quartz (21.30 %) – fragments of rocks: sedimentary (0.20 %) - magmatic (0.10 %) – metamorphic (0.30 %) - muscovite (0.10 %). Grain size: 15-60 µm (54 %), 60-100 µm (29 %), 100-200 µm (12 %), 200-400 µm (5 %). Estimated firing temperature: 800º C.

**Group: TG 11** *Register file Nº 20*
Lab reference: Inv. No. P1288A[17] Final classification: **IV.TG 11**

Vessel shape: amphora ("torpedo" type); handle and shoulder sherd. Wall thickness: 5 mm.
**Fabric:** medium hard (Mohs: 3) – quite regular break – resistant. The break is pinkish grey (7.5YR 6/2) in a thin layer below the outer surface, light brown core (7.5YR 6/3) and thick light brown (7.5YR 6/4) layer below the inner surface. The fabric presents a brown line (vitrified?) and salts.
***Inclusions***: *Ochre* [1] small [1] large. *Sand* [1] fine, quartz and scarce translucent red particles. *Limestone* [2] small and medium with oxidized edges. *Black particles* [1] small and medium, rounded.
*Distribution*: *uniform.*
*Frequency*: ca. 20 %.
***Porosity***: dense. Small and medium pores, scarce large voids. The commonest shapes are rounded, only few irregulars elongated ones.
**Texture and main characteristics:** medium, compact and porous fabric. The non - plastic inclusions are well linked in the matrix, quartz is not frequent. Brown fabric with rounded limestone and red particles contrasting in the groundmass. Smoothed pinkish grey (7.5YR 6/2) surfaces without slip or painting (Plate I:13).
**Comments:** frequent Levantine fabric associated to the "torpedo" type amphorae.
**Thin section:** clay mass (81 %) – quartz (5 %) – fragments of rocks: sedimentary (14 %). Grain size: 15-60 µm (52 %), 60-100 µm (7 %), 100-200 µm (6 %), 200-400 µm (30 %), 400-1.000 (3 %). Estimated firing temperature: 800º C. Light veins of fine crystalline gypsum as evidence of secondary mineralization.

**Group: TG 13** *Register file Nº 3*
Lab reference: Inv. No. P0124A Final classification: **IV.TG 13 = Phoenician 05**

Vessel shape: red polished juglet (rim and neck sherd). Wall thickness: 7.5 mm.
**Fabric:** hard (Mohs: 4-5) – very regular break – high resistance. The break is pink (5 YR 7/4).
***Inclusions***: *Ochre* [1] fine to medium. *Sand* [2] fine . *Limestone* [1] fine.
*Distribution*: uniform, the commonest inclusions are small (angular or rounded).
*Frequency*: ca. 10 %.
***Porosity***: open. Rounded and elongated pores.
**Texture and main characteristics:** very fine and very compact pink or very pale brown (10YR 7/3) fabric, with quartz and ochre inclusions, the last ones contrasting in the matrix. Abundant salts. Smoothed surfaces with red mate slip (5YR 4/6) (Plate I:39).

[17] From Area I, Level VI, L0001; in *Tell el-Ghaba I*, p.177, **No. 287** and Fig. 40:23.

**Comments:** probably Phoenician fabric. Very infrequent but registered in coated amphorae and red slipped juglets.
**Thin section:** clay mass (84 %) – quartz (13.50 %) – fragments of rocks: sedimentary (2.50 %). Grain size: 15-60 µm (76 %), 60-100 µm (19 %), 100-200 µm (5 %). Estimated firing temperature: 700º C.

**Group: TG 16** *Register file Nº 28*
Lab reference: Inv. No. P0503A[18] Final classification: **IV.TG 16**

Vessel shape: White Painted III jar (body sherd). Wall thickness: 7 mm.
**Fabric:** low hardness (Mohs: 2-3) – irregular break – low resistance. Fresh break colour between pink (7.5YR 7/4) and light brown (7.5YR 6/4).
***Inclusions***: *Ochre* [1] small and rounded. *Limestone* [1] small and rounded. *Black particles* [1] small and medium, rounded. *Forams* [1] small. *Shell* [1] small. *Orange particles:* [3] small to very large, tabular with angular edges, orange fine grained rock like shale with abundant iron oxides.
*Distribution*: non uniform.
*Frequency*: ca. 30 %.
***Porosity***: dense. Rounded and elongated pores, irregular elongated voids.
**Texture and main characteristics**: coarse, porous and low compact fabric with orange tabular crushed rocks added as non plastic additive, macroscopically similar to grog and contrasting in the matrix. Outer surface polished and painted in black on a very pale brown (10YR 7/4) slip. Inner surface smoothed with the same self slip. The orange inclusions are visible on both surfaces (Plate I:40).
**Comments:** based on the style, this jar may be a Levantine imitation of the Cypriote White Painted III ware (Fuscaldo personal communication).
**Thin section:** clay mass (54 %) – quartz (9 %) – K-feldspar (0..20 %) – plagioclase(0.30 %) - fragments of rocks: sedimentary (35.6 %) – muscovite (0.50 %) - heavy minerals (0.10 %) - grog (1.30 %). Grain size: 15-60 µm (88 %), 60-100 µm (8 %), 100-200 µm (4 %). Estimated firing temperature: 750º C.

**Group: TG 17** *Register file Nº 18*
Lab reference: Inv. No. P0522A Final classification: **IV.TG 17**

Vessel shape: whitish coated juglet (body sherd). Wall thickness: 4 mm.
**Fabric:** hard (Mohs: 4) –regular break – high resistance. The break is grey (7.5YR 5/1) with red layers below each surface ( 2.5 YR 5/6).
***Inclusions***: *Ochre* [1] small. *Sand* [1] fine and medium. *Limestone* [1] small to large. *Black particles* [1] tiny. *Forams* [1].
*Distribution*: uniform.
*Frequency*: ca. *20 %.*
***Porosity***: open. Small pores to large voids, the commonest rounded, scarce elongated irregular ones.
**Texture and main characteristics:** fine and compact fabric. The small quartz (vitreous and milky) and the limestone inclusions contrasting in the matrix, the last ones like yellowish points. The outer surface with pink slip (7.5 YR 7/4), the inner surface is light red (2.5YR 6/6) (Plate I:10).
**Comments:** Levantine. Some fabrics may be less compact with more abundant limestone. Completely grey fabrics with thinner walls are common.

[18] From Area I, Level VI, L0056; see Addenda, No. 2.

**Thin section:** clay mass (87 %) – quartz (7 %) – fragments of rocks: sedimentary (4.80 %) – metamorphic (0.60 %). Grain size: 15-60 µm (40 %), 60-100 µm (25 %), 100-200 µm (30 %), 200-400 µm (4 %) 400-1.000 µm (1 %). Estimated firing temperature: 800º C.

**Group: TG 18** *Register file Nº 2*
Lab reference: Inv. No. P1064A[19] Final classification: **IV.TG 18**

Vessel shape: amphora (rim sherd). Wall thickness: 8 mm.
**Fabric:** low hardness (Mohs: 2) – regular break – low resistence. The break is grey (7.5YR 5/1) with thin reddish brown layers bellow both surfaces (5YR 5/4).
***Inclusions:*** *Sand* [3] fine to coarse rounded vitreous quartz. *Limestone* [2] small to very large, angular and rounded (soft). *Mica* [1] tiny (as probable muscovite points). Some calcinated organic material (chaff?).
*Distribution*: non uniform.
*Frequency*: ca. 25 %.
***Porosity***: dense. Rounded and elongated pores are the commonest.
**Texture and main characteristics**: coarse, low compact and porous fabric; sandy and with abundant non uniform limestone inclusions. Smoothed pale brown surfaces (10YR 6/3) without slip or painting (Plate I:24).
**Comments:** Levantine. Some fabrics are light brown (7.5YR 6/3) with light grey (7.5YR 6/1) core, thinner walls (6.8 mm) and scarce small black particles and ochre. Many sherds correspond to uncoated "torpedo" type amphorae but it was also recorded in a red coated jar.
**Thin section:** clay mass (72 %) – quartz (23.50 %) – sedimentary rocks (4.50 %). Grain size: 15-60 µm (41 %), 60-100 µm (30 %), 100-200 µm (18 %), 200 –400 µm (11 %). Estimated firing temperature: 800º C. Some sharp grains of Eocene flint.

**Group: TG 19** *Register file Nº 29*
Lab reference: Inv. No. C-0134 (sample 7)[20] Final classification: **IV.TG 19**

Vessel shape: body sherd. Wall thickness: 5 mm.
**Fabric:** very hard (Mohs:›4) – very regular break – high resistance. The break is red (2.5YR 5/6).
***Inclusions***: *Ochre* [1] scarce and fine. *Sand* [1] fine. Rounded and some angular quartz. *Limestone* [2] small and medium, rounded and angular. *Black particles* [1] small to medium pebbles. *Forams* [1] very scarce and small.
*Distribution*: uniform.
*Frequency*: ca. 20 %.
***Porosity***: medium. Rounded and elongated pores and elongated irregular voids.
**Texture and main characteristics**: fine and compact fabric with small quartz and limestone inclusions contrasting in the red matrix. Well smoothed surfaces, the outer surface with pink (7.5YR 7/4) slip, the inner one red (2.5YR 5/6) (Plate I:5).
**Comments:** Levantine. Very similar to TG 03 and TG 32. The section may be half red (2.5 YR 5/6) and half dark grey (7.5 YR 4/1).
**Thin section:** clay mass (80 %) – quartz (6.90 %) - fragments of rocks: sedimentary (12.90 %) – muscovite (0.20 %). Grain size: 15-60 µm (29 %), 60-100 µm (28 %), 100-200 µm (40 %), 200 –400 µm (3 %). Estimated firing temperature: 700º C.

[19] From Area II, Level III, L1089; see Addenda, No. 5.
[20] From Area II, BB/43, sondage.

**Group: TG 21** *Register file Nº 30*
Lab reference: Inv. No. C-1103 (5) (sample 2) Final classification: **IV.TG 21**

Vessel shape: "torpedo" type amphora (shoulder sherd). Wall thickness: 5 mm.
**Fabric:** medium hard (Mohs: 3) – regular break – low resistence. The break is grey (2.5YR 5/1) with two thin yellowish red (5YR 5/6) layers below each surface and pale yellow (2.5 YR 2/4) thick slip.
***Inclusions***: *Ochre* [1] tiny. *Sand* [1] fine, angular vitreous quartz. *Limestone* [2] small to medium, rounded. *Black particles* [1] small and rounded. A few straw hues and probable shell.
*Distribution*: uniform.
*Frequency*: ca.20 %.
***Porosity***: dense. Rounded pores and elongated irregular voids.
**Texture and main characteristics:** quite fine, compact and porous fabric. Limestone particles are the commonest contrasting in the matrix as the tiny ochre inclusions. Some black spots can be seen near the outer surface. Smoothed surfaces with pale yellow (2.5Y 2/4) slip (Plate I:17).
**Comments:** Infrequent Levantine fabric similar to TG 31. Some sherds with thicker walls (8 mm). Coated torpedo type amphorae and red coated pots.
**Thin section:** without sample.

**Group: TG 22** *Register file Nº 11*
Lab reference: Inv. No. C-0200 [010][21] Final classification: **IV.TG 22 = Phoenician 04**

Vessel shape: amphora (shoulder and body sherd). Wall thickness: 8 mm.
**Fabric:** hard (Mohs: 4) – regular break – high resistance. The break is yellowish red (5YR 5/6).
***Inclusions***: *Ochre* [1] fine and medium, rounded. *Sand* [1] fine to medium. *Limestone* [1] fine and rounded, medium very scarce. *Black particles* [1] fine and rounded. *Mica* [1] fine and very clear (muscovite). *Forams* [1] fine.
*Distribution*: quite uniform.
*Frequency*: ca. 20 %.
***Porosity***: medium. Rounded pores are the commonest, the elongated irregular voids are not frequent.
**Texture and main characteristics:** fine, very compact and hard fabric with small quartz, limestone and ochre inclusions. Smoothed surfaces without slip or painting. The outer surface light red (2.5YR 6/8) and red (10R 5/8) inner surface (Plate I:20).
**Comments:** probable Phoenician. Amphorae and White Painted jugs or jars. Some sections have thin red (2.5YR 5/8) or reddish brown (5YR 4/4) layers below each surface. Presence of salts.
**Thin section:** clay mass (87 %) – quartz (6.50 %) - fragments of rocks: sedimentary (6.30 %) – muscovite (0.20 %). Grain size: 15-60 µm (41 %), 60-100 µm (15 %), 100-200 µm (38 %). 200–400 µm (5 %), 400-1.000 µm (1 %). Estimated firing temperature: 700º C.

**Group: TG 23** *Register file Nº 31*
Lab reference: Inv. No. P0381A[22] Final classification: **IV.TG 23**

Vessel shape: amphora (rim sherd). Wall thickness: 7 mm.

[21] From Area I, Level IV, L0084; in *Tell el-Ghaba I*, p.110, **No. 40** and Fig. 23:7.
[22] From Area I, Level VI, L0001; in *Tell el-Ghaba I*, p.178, **No. 303** and Fig. 40:24.

**Fabric:** medium hard (Mohs: 3) – quite regular break – low resistance. The break is reddish yellow (5YR 7/6) with irregular brown (7.5YR 5/2) core.
***Inclusions***: *Ochre* [1] small and rounded. *Sand* [1] fine (vitreous rounded quartz). *Limestone* [2] small to large, rounded. The large ones, very scarce**.** *Black particles* [1] small and rounded. *Red particles* [1] small and angular. *Forams* [1]. Probably clay nodules.
*Distribution*: quite uniform.
*Frequency*: ca. 25 %.
***Porosity***: dense. The elongated and rounded pores are frequent, also the large and very large voids, elongated irregular.
**Texture and main characteristics:** medium, porous and low compact fabric with scarce ochre and quartz inclusions and limestone particles contrasting in the matrix (Plate I:15).
**Comments:** Levantine. This group includes a coarser variety and is related to TG 11 and TG 24. "Torpedo" type amphorae are common, red coated amphorae with everted direct rim, coated and uncoated probable jugs or juglets.
**Thin section:** clay mass (78 %) – quartz (5.80 %) - fragments of rocks: sedimentary (16.20 %). Grain size: 15-60 µm (49 %), 60-100 µm (18 %), 100-200 µm (25 %). 200 –400 µm (8 %). Estimated firing temperature: 750º C. Large nodules of not mixed clay are present.

| **Group: TG 24** | *Register file Nº 14* |
|---|---|
| Lab reference: Inv. No. P1295A[23] | Final classification: **IV.TG 24** |

Vessel shape: "torpedo" type amphora (shoulder sherd). Wall thickness: 6 mm.
**Fabric:** medium hard (Mohs: 3) – irregular break but resistant. The break is pinkish grey (7.5YR 6/2) with very thin light red (2.5YR 6/6) layers below each surface.
***Inclusions***: *Ochre* [1] small to medium. *Sand* [1] fine to medium: milky quartz and tiny red translucent particles. *Limestone* [2] small and [2] large and very large. *Black particles* [1] small. *Forams* [1].
*Distribution*: quite uniform, small and medium sizes and rounded shapes are the commonest.
*Frequency*: ca. 30 %.
***Porosity***: dense and non uniform.
**Texture and main characteristics**: medium, low compact and porous fabric, rather crumbly with rounded limestone particles contrasting in the matrix. Smoothed surfaces with pink (5YR 7/3) slip and red (10R 5/6) inner surface (Plate I:16).
**Comments:** Levantine. Similar to TG 23. Coated and uncoated torpedo type amphorae and coated jugs with collar.
**Thin section:** clay mass (77 %) – quartz (2.30 %) – plagioclase(0.10 %) fragments of rocks: sedimentary (20.60 %). Grain size: 15-60 µm (25 %), 60-100 µm (17 %), 100-200 µm (25 %). 200 –400 µm (30 %), 400-1.000 µm (2 %), 1.000-2.000 µm (1 %). Estimated firing temperature: 750º C.

| **Group: TG 25** | *Register file Nº 23* |
|---|---|
| Lab reference: Inv. No. C-0413 [008] | Final classification: **IV.TG 25** |

Vessel shape: body sherd. Wall thickness: 9 mm.
**Fabric:** hard (Mohs: 4) – regular break – high resistance. The break is light reddish brown (2.5YR 6/3) with red (2.5YR 5/6 and 10R 4/2) zones.
***Inclusions***: *Ochre* [1] small. *Sand* [1] fine to medium. *Limestone* [1] medium to large. *Black particles* [1] small and medium rounded pebbles. *Forams* [2] medium a very clear.
*Distribution*: uniform.

[23] From Area I, Level VI, L0001; in *Tell el-Ghaba I*, p.179, **No. 312** and Fig.40:25.

*Frequency*: ca.15 %.
***Porosity:*** open, non uniform but elongated voids are frequent.
**Texture and main characteristics:** fine and compact fabric with rounded limestone particles, forams and vitreous quartz. Smoothed surfaces, the outer with pale brown (10YR 6/3) slip and the inner reddish yellow (5YR 6/6) (Plate I:11).
**Comments:** similar to TG 17.
**Thin section:** clay mass (92 %) – quartz (2.30 %) – plagioclase(0.10 %) - fragments of rocks: sedimentary (4 %) – magmatic (1.60 %). Grain size: 15-60 µm (61 %), 60-100 µm (20 %), 100-200 µm (16 %). 200–400 µm (3 %). Estimated firing temperature: 700º C.

| **Group: TG 27** | *Register file Nº 32* |
|---|---|
| Lab reference: Inv. No. C-0010 (sample 1) | Final classification: **IV.TG 27** |

Vessel shape: body sherd. Wall thickness: 9 mm.
**Fabric:** hard (Mohs: 4) – quite regular break – high resistance. The break is pale red (7.5R 6/2) with a weak red layer (2.5YR 5/2) below the inner surface.
***Inclusions***: *Ochre* [1] small and rounded. *Sand* [2] fine and medium (rounded vitreous quartz). *Mica* [1] small and medium.
*Distribution*: non uniform.
*Frequency*: ca. 20 %.
***Porosity***: medium. Rounded and elongated pores, elongated irregular voids.
**Texture and main characteristics:** medium, quite laminar and porous fabric, with frequent vitreous quartz, but the inclusions are masked by the matrix colour and limestone particles are not distinguishable (Plate I:41).
**Comments:** Rare fabric, probably Levantine.
**Thin section:** without sample.

| **Group: TG 29** | *Register file Nº 13* |
|---|---|
| Lab reference: Inv. No. P1094A[24] | Final classification: **IV.TG 29** |

Vessel shape: amphora (rim sherd). Wall thickness: 7 mm.
**Fabric:** medium hard (Mohs: 3) - regular break – high resistance. The break is light red (2.5YR 6/6).
***Inclusions***: *Ochre* [1] fine and medium. *Sand* [2] fine (rounded vitreous and milky quartz). *Limestone* [1] fine. *Black particles* [1] fine. *Forams* [1]. One probable clay nodule or grog.
*Distribution*: quite uniform. The small and rounded inclusions are the commonest. *Frequency*: ca. 25 %.
***Porosity***: dense and non uniform.
**Texture and main characteristics:** medium, compact, sandy and porous fabric. Smoothed surfaces, the inner one red (2.5YR 5/6) and the outer surface with pink (5YR 7/3) slip (Plate I: 23).
**Comments:** Levantine. Sections with a light brown (7.5YR 6/3) core are common. Torpedo type amphorae and probably coated jars.
**Thin section:** clay mass (80 %) – quartz (15.90 %) – fragments of rocks: sedimentary (3.90 %). Grain size: 15-60 µm (68 %), 60-100 µm (10 %), 100-200 µm (3 %). 200 –400 µm (14 %), 400-1.000 µm (3 %), 1.000-2.000 µm (1 %). Estimated firing temperature: 750º C.

[24] From Area I, Level VI, L0162; see Addenda, No. 6.

**Group: TG 31** *Register file Nº 34*
Lab reference: Inv. No. P1103A[25] Final classification: **IV.TG 31**

Vessel shape: "torpedo" type amphora (shoulder sherd). Wall thickness: 8 mm.
**Fabric:** medium hard (Mohs: 3) – irregular break – low resistance. The break is grey (2.5YR 5/1).
***Inclusions***: *Ochre* [1] small [1] medium, rounded. *Sand* [1] small and medium vitreous quartz. *Limestone* [2] small to large, rounded and angular. *Black particles* [1] small and medium, rounded and angular. *Forams or shell* [1].
*Distribution*: uniform.
*Frequency*: ca. 25 %.
***Porosity***: dense. Rounded and elongated pores. Elongated irregular voids, most of them corresponding to straw.
**Texture and main characteristics**: medium, compact and porous fabric. Inclusions contrasting in the matrix with limestone particles as the commonest. Smoothed surfaces, the outer one with pale yellow (2.5Y 2/4) slip and light brown (7.5YR 6/3) inner surface (Plate I:14).
**Comments:** fabric similar to Levantine TG 21, very rare. Coated "torpedo" type amphorae and coated jugs.
**Thin section:** clay mass (76 %) – quartz (7.9 %) – fragments of rocks: sedimentary (16.10 %). Grain size: 15-60 µm (86 %), 60-100 µm (6 %), 100-200 µm (5 %). 200 –400 µm (3 %). Estimated firing temperature: 800º C.

**Group: TG 32** *Register file Nº 35*
Lab reference: Inv. No. C-0379 (sample 100)[26] Final classification: **IV.TG 32**

Vessel shape: body sherd. Wall thickness: 5 mm.
**Fabric:** very hard (Mohs: ›4) – very regular break – high resistance. The break presents two layers: yellowish red (5YR 5/6) and brown (7.5YR 5/3).
***Inclusions***: *Ochre* [1] small and rounded. *Sand* [1] fine, rounded vitreous quartz. *Limestone* [2] small and rounded. *Black grit* [1]. *Forams* [1]. *Mica* [1] as points of muscovite.
*Distribution*: very uniform.
*Frequency*: ca. 20 %.
***Porosity***: medium. Rounded, elongated rounded and elongated irregular pores.
**Texture and main characteristics**: very fine and very compact fabric with abundant small and rounded inclusions. Smoothed surfaces, the outer with pink slip (7.5YR 7/4) and the inner surface brown (7.5YR 5/3) (Plate I:6).
**Comments:** fabric similar to TG 3 and TG 19. Levantine. Sections may be dark grey (7.5YR 5/1) with a reddish brown (5YR 5/4) layer below the outer surface. Body sherds and uncoated amphorae.
**Thin section:** clay mass (88 %) – quartz (5.2 %) – fragments of rocks: sedimentary (6.60 %) – muscovite (0.20 %). Grain size: 15-60 µm (67 %), 60-100 µm (14 %), 100-200 µm (19 %). Estimated firing temperature: 700º C.

**Group: TG 35** *Register file Nº 38*
Lab reference: Inv. No. P1244A[27] Final classification: **IV.TG 35 = Phoenician 01**

Vessel shape: body sherd (closed shape). Wall thickness: 5 mm.

[25] From Area VI, Level III, L0507; in *Tell el-Ghaba I*, p.365, **No. 29** and Fig.11:2.
[26] From Area I, Level VI, L0001; see *Tell el-Ghaba I.*
[27] From Area I, Level IV, L0271; in *Tell el-Ghaba I*, p.125, **No. 52** and Fig.30:6.

**Fabric:** very hard (Mohs: ›4) – very regular break – high resistance. The break is reddish yellow (5YR 6/6).
***Inclusions***: *Ochre* [1] small. *Sand* [1] fine. Rounded vitreous quartz. *Limestone* [1] small and rounded. *Black particles* [1] small and rounded. *Forams* [1] small, very scarce. *Mica* [1] points of muscovite. *Red particles* [1] small and rounded.
*Distribution*: uniform.
*Frequency*: <10 %.
***Porosity***: open. Rounded and elongated irregular pores.
**Texture and main characteristics**: very fine, compact and hard reddish yellow fabric. Smoothed surfaces, the outer one with very pale brown slip (10YR 7/4), the inner surface reddish yellow (5YR 6/6) with throwing marks (Plate I:42).
**Comments:** Phoenician. Coated juglets, jugs? and red coated pots.
**Thin section:** clay mass (87 %) – quartz (3.50 %) –K-feldspar (0.30 %) – plagioclase(0.50 %) - fragments of rocks: sedimentary (8.30 %) – magmatic (2.70 %) – metamorphic (1.30 %) – muscovite (0.30 %). Grain size: 15-60 µm (68 %), 60-100 µm (23 %), 100-200 µm (8 %), 200-400 µm (1 %). Estimated firing temperature: 750º C.

**Group: TG 36** *Register file Nº 9*
Lab reference: Inv. No. P0761A[28] Final classification: **IV.TG 36**

Vessel shape: oil lamp. Wall thickness: 6 mm.
**Fabric:** hard (Mohs: ›4) – regular break – high resistance. The break is reddish yellow 5YR 6/6).
***Inclusions***: *Ochre* [2] small to large, rounded. One of them very large and tabular. *Sand* [1] fine to medium rounded vitreous quartz. *Limestone* [2] small to large, angular, very scarce rounded. *Black particles* [1] small to medium, angular and rounded.
*Distribution*: non uniform.
*Frequency*: ca. 15-20 %.
***Porosity***: open. Rounded and elongated pores but elongated irregular voids are frequent.
**Texture and main characteristics:** medium, compact and hard reddish yellow fabric with non uniform inclusions contrasting in the matrix and abundant ochre and limestone inclusions. Smoothed surfaces, the outer one light red (2.5YR 6/6) and the inner surface reddish yellow (5YR 6/6) (Plate I:9).
**Comments:** Levantine. Similar to TG 01. Some fabrics are less compact and more porous, brown zones may be common. Another with greyish brown (10YR 5/2) core and scarce tiny forams. Black-on-Red juglets, coated and uncoated juglets and jars? and uncoated oil lamps with flat base.
**Thin section:** clay mass (78 %) – quartz (9.90 %) - fragments of rocks: sedimentary (12 %) – muscovite (0.10 %). Grain size: 15-60 µm (50 %), 60-100 µm (12 %), 100-200 µm (33 %), 200-400 µm (5 %). Estimated firing temperature: 700º C.

**Group: TG 37** *Register file Nº 40*
Lab reference: Inv. No. P0511A[29] Final classification: **IV.TG 37 = Phoenician 03**

Vessel shape: "torpedo" type amphora (handle, shoulder and body sherds). Wall thickness: 8 mm.
**Fabric:** medium hard (Mohs: 3) – regular break – high resistance. The break is dark greyish brown (10YR 4/2) with a diffuse very dark grey (10YR 3/1) layer below the inner surface.

[28] From Area I, Level II, L0040; in *Tell el-Ghaba I*, p.63, **No. 86** and Fig.3:5.
[29] From Area I, Level II, L0050 = L0052; in *Tell el-Ghaba I*, p.68, **No. 19** and Fig.4:3.

***Inclusions***: *Ochre* [1] medium, angular. *Sand* [1] fine, rounded vitreous quartz. *Limestone* [2] fine to very large, rounded and angular. One tabular inclusion (6 mm). *Black particles* [1] small and rounded. *Forams* [2] small. *Shell* [1] small. *Mica* [1] points of muscovite. *Black particles* [1] medium and rounded, probably clay nodules. Dark zones are common (probably burnt organic material).
*Distribution*: quite uniform.
*Frequency*: ca. 20 %.
***Porosity***: medium. Rounded and elongated pores and elongated irregular voids.
**Texture and main characteristics**: very compact and fine sandy fabric with non uniform limestone inclusions and forams. Smoothed surfaces, the outer dark greyish brown (10YR 4/2), the inner surface is dark grey (10YR 3/1) (Plate I:21).
**Comments:** Phoenician. Similar to TG 22. Some sherd with very pale brown (10YR 7/3) slip. Coated and uncoated juglets and torpedo type amphorae.
**Thin section:** clay mass (82 %) – quartz (5 %) – plagioclase(0.10 %) - fragments of rocks: sedimentary (12.90 %). Grain size: 15-60 µm (75 %), 60-100 µm (9 %), 100-200 µm (14 %). 200–400 µm (2 %).Estimated firing temperature: 700º C.

**Group: TG 38** *Register file Nº 41*
Lab reference: Inv. No. P0125A Final classification: **IV.TG 38 = Phoenician 02**

Vessel shape: red polished bowl (body sherd). Wall thickness: 2.5 mm.(2.5 – 10 mm).
**Fabric:** medium hard (Mohs: 3) - very regular break - high resistance. The break is reddish yellow (5Y/R 6/6).
***Inclusions***: *Ochre* [2] small and medium, rounded. *Sand* [2] fine, rounded vitreous quartz. *Limestone* [2] small to very large, rounded and sub-angular. *Black particles* [1] small and medium, rounded. *Forams* [1] small. *Red particles* [1] small and medium, rounded. Some light and rounded inclusions (clay nodules or organic material?). *Distribution*: non uniform.
*Frequency*: ca. 25 %.
***Porosity***: medium. Rounded and elongated pores and few elongated irregular voids.
**Texture and main characteristics**: fine and very compact reddish yellow fabric with some non uniform limestone inclusions contrasting in the matrix, some orange particles (ochre) contain inclusions and pinkish translucent particles. Smoothed surfaces, the outer one with very pale brown (10YR 8/4) slip. The inner surface is reddish yellow (5YR 7/6) (Plate I:22).
**Comments:** Phoenician. Similar to TG 37. White Painted bowls or juglets, red coated jugs, coated bowls and probable Black-on-Red juglets and Bichrome (IV) bowls.
**Thin section:** clay mass (70 %) – quartz (9.90 %) - fragments of rocks: sedimentary (20 %) – muscovite (0.10 %). Grain size: 15-60 µm (46 %), 60-100 µm (11 %), 100-200 µm (36 %), 200-400 µm (7 %). Estimated firing temperature: 700º C.

**Group: TG 39** *Register file Nº 2*
Lab reference: Inv. No. P1185A[30] Final classification: **VII.TG 39**

Vessel shape: Black-on-Red I juglet (neck sherd). Wall thickness: 3.5 mm.
**Fabric:** medium hard (Mohs: 3) – very regular break – high resistance. The break is pink (5YR 7/4).
***Inclusions***: *Ochre* [1] very fine and rounded. *Sand* [2] very fine. *Limestone* ?[1] very scarce, fine and rounded. *Mica* [1].
*Distribution*: uniform.

[30] From Area II, Level V, L1001; in *Tell el-Ghaba I*, p.336, **No. 132** and Fig. 58:14.

*Frequency*: <10 %.
***Porosity***: open. Small and rounded pores, the elongated irregular ones are not frequent.
**Texture and main characteristics**: very fine and very compact fabric without non plastic additives and very fine sandy groundmass. Polished outer surface painted with intermediate colour between reddish brown (2.5YR 5/4) and red (2.5YR 5/6). Smoothed inner surface reddish yellow (5YR 7/6) (Plate I:36).
**Comments**: Aegean. TG 04 is similar but coarser and softer. Some fabrics are red (7.5YR 5/6) or grey (7.5YR 6/2) others with ochre particles more abundant or scarce fragments of rocks. Black-on-Red I, II and III jugs, juglets and pots. Uncoated bowls and bottles. Coated pilgrim flasks, coated and uncoated juglets, red coated juglets with ring or flat base. Plain White bowls, Bichrome (IV) jugs and juglets with whitish slip.
**Thin section:** clay mass (90 %) – quartz (9.60 %) – muscovite (0.10 %) – biotite (0.20 %) - heavy minerals (0.10 %). A rounded grain of flint is present in this sample. Grain size: 15-60 µm (98 %), 60-100 µm (1 %), 100-200 µm (1 %). Estimated firing temperature: 700º C.

**Group: TG 40** *Register file Nº 43*
Lab reference: Inv. No. P0755A[31] Final classification: **VI.TG 40**

Vessel shape: White Painted III barrel-shaped jug. Wall thickness: 4 mm.
**Fabric:** medium hard (Mohs: 3) – regular break – low resistance. The break is light brownish grey (10YR 6/2).
***Inclusions***: *Ochre* [1] fine and rounded. *Sand* [2] fine, rounded vitreous quartz. *Limestone*? [1] scarce and fine. *Black particles* [2] small. *Mica* [1] as tiny points. *Distribution*: uniform.
*Frequency*: ca. 20 %.
***Porosity***: dense. Rounded and elongated pores.
**Texture and main characteristics**: fine, porous, low compact and sandy fabric with abundant black particles (Plate I:29).
**Comments:** Cypriote. This fabric may be coarser with thicker walls, another variety has coarse and rounded white inclusions. White Painted jars, juglets, bowls, jugs and amphorae. Bichrome and White Painted barrel-shaped juglets. Coated amphorae and uncoated probable jars with pointed base, juglets with whitish slip.
**Thin section:** clay mass (89 %) – quartz (7.60 %) – muscovite (0.10 %) - heavy minerals (0.10 %)- K-feldspar (1.30 %) – plagioclase(1 %) – fragments of rocks: sedimentary (0.50 %) – magmatic (0.40 %). Grain size: 15-60 µm (48 %), 60-100 µm (42 %), 100-200 µm (9 %), 200-400 µm (1 %). Estimated firing temperature: 800º C.

**Group: TG 41** *Register file Nº 44*
Lab reference: Inv. No. P0193A Final classification: **VII.TG 41**

Vessel shape: Black-on-Red II pot (body sherd). Wall thickness: 2 mm.
**Fabric:** medium hard (Mohs:3) - regular break – low resistance. The break is red (7.5R 5/6).
***Inclusions:*** *Limestone* [1] small and medium, rounded. *Black particles* [1] small, rounded.
*Distribution*: non uniform.
*Frequency*: <10 %.
***Porosity***: open. Rounded pores and elongated irregular voids.
**Texture and main characteristics**: very fine and compact fabric with scarce limestone and black particles contrasting in the red matrix. This fabric correspond to a clay with scanty natural inclusions, without non plastic additives. Outer surface polished and painted in red (10YR 5/6), smoothed inner surface light red (10YR 6/6) (Plate I:37).

[31] From Area II, Level V, L1001; in *Tell el-Ghaba I*, p.331, **No. 97**.

**Comments:** Aegean. Black-on-Red II and III pots and juglets. Probably uncoated juglets.
**Thin section:** without sample.

| **Group: TG 42** | *Register file Nº 45* |
|---|---|
| Lab reference: Inv. No. P0374A[32] | Final classification: **VI.TG 42** |

Vessel shape: Black-on-Red jar (body sherd). Wall thickness: 5 mm.
**Fabric:** medium hard (Mohs: 3) – regular break – low resistance. The break is yellowish red (5YR 5/6) with dark grey (5YR 4/1) core.
***Inclusions***: *Sand* [2] fine [1] medium and coarse, rounded and angular. *Limestone*? [1] medium and large, rounded. *Black particles* [1] small and medium, rounded. *Brown particles* [1] large and rounded. *Mica* [1]. Presence of salts.
*Distribution*: non uniform.
*Frequency*: 15%.
***Porosity***: medium. Rounded and elongated pores.
**Texture and main characteristics**: fine, compact and quite porous sandy fabric. Smoothed surfaces, the outer with light reddish brown slip (5YR 6/4), the inner surface pink (7.5YR 5/4) (Plate I:31).
**Comments:** probably Cypriote. Some fabrics with larger rounded limestone inclusions, also the fresh breaks may be dark grey with red core. Some sherds with thicker walls (7 mm). Coated juglets, Black-on-Red I (III), II (IV) and III (V), and White Painted juglets.
**Thin section:** clay mass (80 %) – quartz (9.50 %) – K-feldspar (3.10 %) – plagioclase(4.40 %) - fragments of rocks: magmatic (1.70 %) – metamorphic (0.20 %) – muscovite (0.90 %) – biotite (0.10 %) - heavy minerals (0.10 %). Grain size: 15-60 µm (80 %), 60-100 µm (11 %), 100-200 µm (5 %), 200-400 µm (1 %), 400-1.000 µm (3 %). Estimated firing temperature: 700º C.

| **Group: TG 43** | *Register file Nº 46* |
|---|---|
| Lab reference: Inv. No. P0394A[33] | Final classification: **VI.TG 43** |

Vessel shape: red coated juglet (body sherd). Wall thickness: 5 mm.
**Fabric:** medim hard (Mohs: 3) - regular break - low resistance. The break is yellowish red (5YR 5/6) and grey (5YR 6/1) with dark irregular zones.
***Inclusions***: *Ochre* [1] fine , rounded. *Sand* [2] fine to medium, vitreous quartz. *Limestone* [1] small and rounded. *Black particles* [1] fine to medium, rounded, angular and tabular. *Mica*?.
*Distribution*: uniform.
*Frequency*: ca. 20 %.
***Porosity***: dense. Rounded and elongated pores and elongated voids.
**Texture and main characteristics:** fine, low compact and porous fabric with sandy groundmass. Smoothed surfaces, the outer one with mate dark grey (7.5YR 4/1) slip and light brown (7.5YR 6/4) inner surface (Plate I:32).
**Comments:** Cypriote. Fabric similar to TG 42 but "talcose" and with more uniform fine inclusions . The break may show five different colours: dark grey (7.5YR 4/1) slip, two thin pink (7.5YR 8/4 and 5YR 7/3) layers and a thick light grey (7.5YR 7/1) layer with a pink (5YR 7/3) zone below the inner surface. Some sherds with pink (7.5YR 8/3) or black mate slip. Coated juglets, "torpedo" type amphorae, Black-on-Red style.
**Thin section:** clay mass (81 %) – quartz (15.20 %) – K-feldspar (1.20 %) – plagioclase(0.80

[32] From Area II, Level V, L1001; in *Tell el-Ghaba I*, p. 332, **No. 107** and Fig. 58:11.
[33] From Area I, Level VI, L0001; in *Tell el-Ghaba I*, p. 186, **No. 379** and Fig. 40:29.

%) - fragments of rocks: sedimentary (1.60 %) – muscovite (0.10 %). Grain size: 15-60 µm (80 %), 60-100 µm (16 %), 100-200 µm (4 %). Estimated firing temperature: 750º C.

**Group: TG 44** *Register file Nº 47*
Lab reference: Inv. No. C-0243 [002][34] Final classification: **VI.TG 44**

Vessel shape: uncoated jar (rim sherd). Wall thickness: 5 mm. (5-8 mm).
**Fabric:** soft (Mohs: 2) - irregular break – low resistance. The break is pink (7.5YR 7/4)
***Inclusions***: *Ochre* [2] fine to large, rounded. *Sand* [1] fine to large, rounded vitreous quartz. *Limestone* [1] fine to large, rounded. *Black particles* [1] fine and rounded. *Forams* ? [1] fine. *Mica*?.
*Distribution*: quite uniform.
*Frequency*: ca. 20 %.
***Porosity***: dense. Rounded pores and elongated and thick large voids (straw ?).
**Texture and main characteristics:** medium, soft (talcose), low compact and porous pink fabric. Sandy matrix with abundant non uniform rounded ochre particles and some large limestone and quartz inclusions. Smoothed surfaces reddish yellow (7.5YR 6/6) without slip or painting (Plate I:19).
**Comments**: Probably Cypriote. This group is similar to TG 04 but coarser and with more ochre particles. Some sherds with thinner walls. Uncoated juglets.
**Thin section:** clay mass (85 %) – quartz (4.40 %) - fragments of rocks: sedimentary (10.40 %) – muscovite (0.20 %). Grain size: 15-60 µm (75 %), 60-100 µm (14 %), 100-200 µm (5 %), 200-400 µm (6 %). Estimated firing temperature: 750º C.

**Group: TG 45** *Register file Nº 48*
Lab reference: Inv. No. P0710A[35] Final classification: **VII.TG 45**

Vessel shape: red polished juglet (body sherd). Wall thickness: 3.5 mm .
**Fabric:** hard (Mohs: 4) - regular break – high resistance. The break is light red (2.5YR 6/6).
***Inclusions***: *Sand* [1] very fine**.** *Black particles* [1] tiny and very scarce.
*Frequency*: <10 %.
*Distribution*: uniform.
***Porosity***: open. Elongated pores.
**Texture and main characteristics:** very fine and compact fabric without non plastic inclusions added. Well polished outer surface with reddish yellow slip (5YR 6/6). Pink smoothed inner surface (7.5YR 7/3) (Plate I:38).
**Comments**: Aegean fabric similar to TG 41. Sherds of this group have wall thickness between 2 mm and 4 mm. Some fabrics may be dark grey (5YR 4/1) or reddish grey (5YR 5/2). A variety of this group with scarce small and rounded whitish particles (limestone?) as natural inclusions in the clay. Very common imported fabric used in the manufacture of small and decorated vessels. Black-on-Red I, II and III juglets and jugs, pots with whitish slip, red coated juglets and pots, red polished juglets, and coated pilgrim flasks.
**Thin section:** clay mass (96 %) – quartz (2.40 %) – heavy minerals (0.10 %). Grain size: 15-60 µm (90 %), 60-100 µm (9 %), 100-200 µm (1 %). Estimated firing temperature: 800º C.

**Group: TG 46** *Register file Nº 49*
Lab reference: Inv. No. P0048A (+ P0392A)[36] Final classification: **VII.TG 46 (Chian)**

[34] From Area I, Level II, L0079; in *Tell el-Ghaba III* (forthcoming).
[35] From Area I, Level III, L0289; in *Tell el-Ghaba I*, p. 84, **No. 41** and Fig. 13:2.
[36] From Area I, Level VI, L0001; in *Tell el-Ghaba I*, p. 190, **No. 413** and Fig. 40:33.

Vessel shape: coated amphora (two body sherds). Wall thickness: 6.5 mm.
**Fabric:** medium hard (Mohs: 3) - regular break - high resistance. The break is reddish yellow (5YR 6/6).
***Inclusions***: *Ochre* [1] small and rounded. *Sand* [2] medium, vitreous quartz. *Whitish particles* [1] fine to large, rounded. *Black particles* [1] small and large, rounded. *Mica* [1] points of muscovite. One large and rounded yellowish brown particle (limestone?). *Distribution*: non uniform.
*Frequency*: ca. 25 %.
***Porosity***: medium. Rounded and elongated pores and elongated irregular voids.
**Texture and main characteristics**: medium, compact, porous and sandy reddish yellow fabric. Smoothed surfaces, the outer one painted in red (2.5YR 5/6) on very pale brown (10YR 8/3) slip. The inner surface reddish brown (5YR 5/4) with weak throwing lines (Plate I:33).
**Comments:** Aegean fabric from Chios. Uncoated and coated jars, juglets and amphorae. Fabric present in juglets of Akhziv type.
**Thin section:** clay mass (72 %) – quartz (15.60 %) – plagioclase(1.80 %) - fragments of rocks: magmatic (6.10 %) – metamorphic (3.20 %) – muscovite (1 %) – biotite (0.20 %) - heavy minerals (0.10 %). Grain size: 15-60 µm (75 %), 60-100 µm (15 %), 100-200 µm (6 %), 200-400 µm (1 %), 400-1.000 µm (5 %), 400-1.000 µm (1 %). Estimated firing temperature: 800º C.

**Group: TG 47** *Register file Nº 50*
Lab reference: Inv. No. P0380A[37] Final classification: **II?TG 47**

Vessel shape: large bowl ("mortarium"); rim sherd. Wall thickness: 11 mm - thick
**Fabric:** very hard (Mohs: ›4) - quite regular break - high resistance. The break is very pale brown (10YR 8/4).
***Inclusions***: *Ochre* [1] fine to medium, rounded. *Sand* [2] medium [1] coarse, vitreous and pinkish quartz, rounded. *Limestone*? [1] fine to coarse, rounded. *Black particles* [1] small and rounded. *Whitish particles* [1] fine to medium, rounded.
*Distribution*: quite uniform.
*Frequency*: ca. 20 %.
***Porosity***: dense. Rounded and elongated pores and elongated irregular voids.
**Texture and main characteristics**: medium, low compact and hard fabric; sandy and porous with pink translucent inclusions and ochre particles contrasting in the light matrix. Smoothed surfaces pale brown (10YR 6/3) without slip or painting (Plate I:25).
**Comments:** very uncommon fabric. Uncoated bowls ("mortaria") and White Painted (V) amphorae.
**Thin section:** clay mass (86 %) – quartz (7.70 %) – K-feldspar (1 %) – plagioclase(0.80 %) - fragments of rocks: magmatic (3.20 %) – metamorphic (1.20 %) - heavy minerals (0.10 %). Grain size: 15-60 µm (59 %), 60-100 µm (15 %), 100-200 µm (18 %), 200-400 µm (8 %). Estimated firing temperature: 800º C.

**Group: TG 48** *Register file Nº 51*
Lab reference: Inv. No. P0712A[38] Final classification: **VII.TG 48 (Samian)**

Vessel shape: White Painted/Bichrome bowl (body sherd). Wall thickness: 5 mm..
**Fabric:** medium hard (Mohs: 3) – regular break – high resistance. The break is light red (2.5YR 7/6).

[37] From Area I, Level I, L0007; in *Tell el-Ghaba I*, p. 133, **No. 24** and Fig.32:2.
[38] From Area I, Level VI, L0001; in *Tell el-Ghaba I*, p. 187, **No. 392** and Fig. 40:29.

***Inclusions***: *Ochre* [2] small (predominant) to large, rounded. *Sand* [1] fine [1] medium, rounded vitreous quartz. *Limestone* [2] small (predominant) to large, rounded. *Black particles* [2] small and rounded. *Forams* [1] very scarce and small. *Mica* [1] few points of muscovite.
*Distribution*: quite uniform.
*Frequency*: ca. 30 %.
***Porosity***: medium. Rounded and elongated irregular pores.
**Texture and main characteristics:** quite fine and sandy light red fabric with abundant ochre, quartz, limestone and black inclusions, small and rounded. The outer surface is White Painted (IV) ware: dark reddish grey (5YR 5/2) painted decoration on very pale brown (10YR 8/3) slip. The inner surface is Bichrome (IV) ware: dark reddish grey (5YR 5/2) on natural colour reddish yellow (5YR 7/6). It is a mixed fine ware, White Painted and Bichrome (Plate I:35).
**Comments:** Aegean fabric. A fine variety with a thin pink (7.5YR 7/3) layer below the outer surface and thinner walls. White Painted (IV), coated juglets and White Painted bowls sometimes with Bichrome interior surfaces.
**Thin section:** without sample.

**Group: TG 49** *Register file Nº 52*
Lab reference: Inv. No. P0703A[39] Final classification: **VI.TG 49**

Vessel shape: Black-on-Red II (IV) deep bowl with horizontal handle (rim and handle sherd). Wall thickness: 4 mm.
**Fabric:** quite soft (Mohs: 2-3) - irregular break - low resistance. The break is reddish yellow (7.5YR 6/6).
***Inclusions***: *Ochre* [1] small to large, rounded. *Sand* [1] fine and medium rounded vitreous quartz. *Limestone*? small to large, rounded. *Black particles* [2] small to large, angular and rounded. *Forams* [1] fine. *Whitish, brown* and *dark particles* [2] fine to coarse and a probable clay nodule (light and rounded).
*Distribution:* non uniform.
*Frequency*: ca.15 %.
***Porosity***: dense. Rounded and elongated pores and elongated irregular voids.
**Texture and main characteristics**: medium, porous and quite soft and crumbly fabric with black particles contrasting in the reddish yellow matrix. Smoothed surfaces.
**Comments:** Probable Cypriote fabric similar to TG 46. Black-on-Red II (IV) and White Painted II, White Painted IV juglets, uncoated amphorae and jars, coated juglets or jugs. Some fabrics with fine texture may be considered as a variety of this group (Plate I:34).
**Thin section:** clay mass (81 %) – quartz (4.90 %) – K-feldspar (3.30 %) – plagioclase(0.60 %) - fragments of rocks: magmatic (6.40 %) – metamorphic (3.30 %) - heavy minerals (0.20 %). Grain size: 15-60 µm (76 %), 60-100 µm (7 %), 100-200 µm (4 %), 200-400 µm (10 %), 400-1.000 µm (2 %), 1.000-2.000 µm (1 %). Estimated firing temperature: 800º C.

**Group: TG 51** *Register file Nº 57*
Lab reference: Inv. No. P0146A + P0150A[40] Final classification: **IV.TG 51**

Vessel shape: fine amphora; Bichrome ware (body sherd). Wall thickness: 7.5 mm.
**Fabric:** hard (Mohs: 4) but with irregular break and low resistance. The break is reddish yellow (5YR 6/6).
***Inclusions***: *Ochre* [2] fine to coarse, rounded and tabular with tiny inclusions and forams

[39] From Area III, L2001; see Addenda, No. 7.
[40] From Area I, Level IV, L0033 + L0004; see Addenda, No. 3.

inside. *Sand* [2] fine to medium (vitreous quartz). *Limestone* [2] fine and medium, rounded. *Black particles* [2] small, rounded, tabular and angular. One large and rounded black inclusion (burnt seed?). *Forams* or *shell* [1].
*Distribution*: quite uniform.
*Frequency*: ca. 30 %.
***Porosity***: dense. Rounded and irregular elongated pores.
**Texture and main characteristics**: medium, sandy and porous fabric. Limestone inclusions are rather altered and non uniform ochre particles are characteristics, they contrast in the matrix just as the black ones. The outer surface is polished and decorated in the Bichrome style; the inner surface is smoothed, reddish yellow (5YR 7/6) (Plate I:7).
**Comments:** Levantine. Fabric very similar to Tell el-Dab`a IV.19. Bichrome bottles and probably amphorae and juglets. White Painted juglets. Coated and uncoated "torpedo" type amphorae and jars.
**Thin section:** clay mass (78 %) – quartz (7.5 %) – fragments of rocks: sedimentary (14.50 %). Grain size: 15-60 µm (22 %), 60-100 µm (13 %), 100-200 µm (51 %), 200-400 µm (14 %). Estimated firing temperature: 700º C.

**Group: TG 52** *Register file Nº 60*
Lab reference: Inv. No. P0883A[41] Final classification: **IV.TG 52**

Vessel shape: "torpedo" type amphora (shoulder sherd) Wall thickness: 10 mm
**Fabric:** hard (Mohs: 4) but with irregular break and low resistance. The break is reddish yellow (5YR 6/6).
***Inclusions***: *Ochre* [2] fine to coarse, rounded and tabular with tiny inclusions and forams inside, coarse particles are very common. *Sand* [2] fine to medium (vitreous quartz). *Limestone* [2] fine and medium, rounded. *Black particles* [2] small, rounded, tabular and angular. *Forams* or *shell* [1].
*Distribution*: non uniform.
*Frequency*: ca. 30 %.
***Porosity***: dense. Rounded and irregular elongated pores, some elongated irregular voids.
**Texture and main characteristics**: medium, sandy and porous fabric. Smoothed surfaces reddish yellow (5Y/R 6/6). Without slip or painting (Plate I:8).
**Comments:** Levantine. Fabric similar to TG 51 with coarse inclusions more common and less uniform distribution. This group may be considered a coarser variety of TG 51 (similar to Tell el-Dab`a IV.19 coarse). Bichrome jars, jugs or amphorae. Coated and uncoated "torpedo" type amphorae. Uncoated jars and coated juglets, jugs or jars.
**Thin section:** clay mass (78 %) – quartz (6.7 %) – fragments of rocks: sedimentary (15.30 %). Grain size: 15-60 µm (75 %), 60-100 µm (2 %), 100-200 µm (12 %), 200-400 µm (11 %). Estimated firing temperature: 700º C. Fragments of charcoal are present.

**Group: TG 53** *Register file Nº 54*
Lab reference: Inv. No. P0133A Final classification: **IV.TG 53**

Vessel shape: amphora (body sherd). Wall thickness: 5 mm. (5-8 mm)
**Fabric:** medium hard (Mohs: 3) - regular break - resistant. The break is light brown (7.5YR 6/4).
***Inclusions***: *Ochre* [1] small [1] medium, rounded. *Sand* [2] fine [1] medium, rounded vitreous quartz. *Limestone* [1] small. *Black particles* [2] small [1] medium, rounded. *Forams ?* [1] small.

[41] From Area I, Level VI, L0001; in *Tell el-Ghaba I*, p. 182, **No. 346** and Fig.40:27.

*Distribution*: uniform.
*Frequency*: ca. 30 %.
***Porosity:*** dense. Rounded and elongated pores.
**Texture and main characteristics**: medium, porous and very sandy fabric with abundant ochre and black particles contrasting in the light brown matrix. Smoothed surfaces with very pale brown (10YR 7/3) slip (Plate I:30).
**Comments:** Levantine. Fabric very similar to Tell el-Dab`a IV.9. Bichrome amphorae, jugs or jars. Coated and uncoated amphorae and probably jugs. White Painted bowls, jugs and probably amphorae, juglets or jars.
**Thin section:** clay mass (77 %) – quartz (20 %) –K-feldspar (0.20 %) – plagioclase(0.10 %) - fragments of rocks: sedimentary (7.60 %) – metamorphic (0.10 %). Grain size: 15-60 µm (38 %), 60-100 µm (16 %), 100-200 µm (40 %), 200-400 µm (6 %).
Estimated firing temperature: 800º C.

**Group: TG 57** *Register file Nº 55*
Lab reference: Inv. No. P1193A[42] Final classification: **IV.TG 57**

Vessel shape: Black-on-Red jug (body sherd). Wall thickness: 5 mm.
**Fabric:** medium hard (Mohs: 3) - regular break - high resistance. The break is reddish yellow (5YR 6/6).
***Inclusions***: *Ochre* [1] small and rounded. *Sand* [2] fine [1] medium, rounded vitreous quartz and scarce reddish translucent particles. *Limestone* [1] small and medium, rounded, tabular and angular. *Black particles* [1] small [1] medium, rounded and angular. *Forams* [1] small. *Mica* [1] fine (muscovite). *Grey particles* [1] small. *Straw* [1].
*Distribution*: uniform.
*Frequency*: >30 %.
***Porosity***: medium. Rounded and elongated pores. Elongated irregular voids, most of them correspond to straw.
**Texture and main characteristics**: fine, compact and porous fabric. Very sandy matrix with abundant black particles and straw. Smoothed surfaces with pale yellow (2.5Y 8/3) slip (Plate I: 43).
**Comments:** Levantine. Similar fabric to one Tell el-Dab`a sample classified as TD IV.12. Some fabrics with different colours in four layers: reddish yellow (5YR 6/6), pink (5YR 7/4), grey (5YR 5/1) and a thin reddish yellow (5YR 6/6) layer below the inner surface. Black-on-Red ware. Jugs.
**Thin section:** without sample.

**Group: TG 58** *Register file Nº 56*
Lab reference: Inv. No. P0785A[43] Final classification: **VII.TG 58**

Vessel shape: Black-on-Red II juglet (handle) sherd. Wall thickness: 6.5 mm
**Fabric**: very hard (Mohs: ›4) – regular break – high resistance. The break is red (2.5YR 5.8).
***Inclusions***: *Ochre* [1] small to very large, rounded. *Sand* [2] fine to coarse (rounded vitreous quartz). *Limestone* [1] fine and rounded. *Forams* [1] small. *Grey particles* [2] fine to coarse, rounded and soft. *Black particles* [1] fine. One whitish translucent inclusion, some brown particles and a burnt organic inclusion.
*Distribution*: non uniform, rounded shapes are the commonest.
*Frequency*: ca.20%.

[42] From Area I, Level IV, L0017; in *Tell el-Ghaba I*, p. 96, **No. 25** and Fig.18:3.
[43] From Area II, Level II, L1126; in *Tell el-Ghaba I*, p. 241, **No. 51**.

***Porosity***: medium, rounded and elongated irregular pores.
**Texture and main characteristics:** medium, compact and red fabric with rounded grey inclusions. Both surfaces painted with black lines, without slip (Plate I:45).
**Comments:** Probably Aegean. Matrix and pores similar to TG 45. Some fabrics are fine or coarse with grey core. Wall thickness between 1 to 7 mm. Black-on-Red II (IV) juglets with very fine fabric and coated jars with very coarse fabric.
**Thin section:** clay mass (82%) – quartz (12%) –K-feldspar (0.10%) – plagioclase(0.40%) - fragments of rocks: sedimentary (3.80%) - magmatic (1.50%) – grog (1%). Grain size: 15-60 µm (83%), 60-100 µm (10%), 100-200 µm (3%), 200-400 µm (2%), 1.000-2.000 µm (2%). Estimated firing temperature: 750ºC.

**Group: TG 59** *Register file Nº 57*
Lab reference: Inv. No. P2042A[44] Final classification: **II?TG 59**

Vessel shape: "torpedo" type amphora (rim and shoulder sherd). Wall thickness: 9 mm.
**Fabric:** medium hard (Mohs: 3) – regular and resistant break. Very pale brown (10YR 7/3) fabric with a thin light red (2.5YR 7/6) layer below the outer surface.
***Inclusions***: *Ochre* [2] small to large, rounded. *Sand* [1] fine. *Limestone* [2] small, very scarce large and rounded. *Black particles* [1] small. *Forams* [1] small and medium. *Mica* [1] as muscovite points. *Brown particles* [1] large, rounded and tabular. *Straw* [1] as long and thin voids. *Clay nodule:* large and light brown.
*Distribution*: non uniform, rounded shapes are the commonest.
*Frequency*: ca. 20 %.
***Porosity***: open. Small and rounded pores, elongated voids (straw).
**Texture and main characteristics**: medium and compact pale brown fabric with straw, dark orange ochre, limestone and forams. Smoothed surfaces, very pale brown (10YR 7/4) without slip (Plate I: 44).
**Comments:** Probably pottery from Sinai or South Palestine. Torpedo morphological class (90º shoulder angle)
**Thin section:** without sample.

**Group: TG 61** *Register file Nº 59*
Lab reference: Inv. No. C-0138 (sample 1) Final classification: **IV?TG 61**

Vessel shape: body sherd. Wall thickness: 7 mm.
**Fabric:** very hard (Mohs: ›4) – irregular break – high resistance. The break is light red (2.5YR 6/6) with abundant orange, white and dark inclusions.
***Inclusions***: *Ochre* [3] fine to coarse, rounded with tiny inclusions inside. Some of them look like grog. *Sand* [2] fine to coarse rounded vitreous and milky quartz. *Limestone* [2] fine to coarse, rounded. *Black particles* [2] small and medium, translucent and rounded. *Mica* [1] as scarce points. *Greyish particles* [1] small. Probable *forams.*
*Distribution*: non uniform.
*Frequency*: ca 30 %.
***Porosity***: medium. Elongated irregular pores.
**Texture and main characteristics**: quite coarse and compact fabric with abundant orange and some large limestone inclusions, both of them contrasting in the light red groundmass. Smoothed surfaces, the outer with pink slip (5YR 7/3) and the inner surface light red (2.5YR 6/6) (Plate I: 46).
**Comments:** Probable Levantine fabric macroscopically similar to TG 16.

[44] From Area VI, Level I, L0546; in *Tell el-Ghaba I*, p. 354, **No. 7** and Fig.4.

**Thin section:** clay mass (72 %) – quartz (9.50 %) – fragments of rocks: sedimentary (4.40 %) – grog (6.50 %). Carbonates (5.60 %). Other (1.90 %). Grain size: 15-60 μm (68 %), 60-100 μm (12 %), 100-200 μm (13 %), 200-400 μm (4 %), 400- 1.000 μm, 1.000-2.000 μm (1 %). Estimated firing temperature: 750º C.

## Results

Based on similarities and dissimilarities among TG fabrics described above three main clusters and their varieties are stated. These clusters are suggested considering the co-variations of the following attributes: texture, non plastic inclusions types and their relative abundance. Likewise taking in account the vessel shapes and the wares assigned to the analysed sherds non local probable proveniences are proposed (II Sinai or South Palestinian, IV Levantine, VI Chipriote and VII Aegean).

***CLUSTER 1***: fabrics with limestone inclusions

***1.1***: oxidized – compact - fine to coarse – in general limestone inclusions more abundant than sand - ochre. Muscovite, plagioclaseand forams may be present. Levantine "torpedo" type amphorae, Bichrome jugs or juglets, probably coated juglets, uncoated oil lamps with flat base, Black-on-Red juglets.
IV.TG 01
IV.TG 03
IV.TG 05
IV.TG 06
IV.TG 19
IV.TG 29
IV.TG 32
IV.TG 36
IV.TG 51
IV.TG 52

***1.2***: fine - compact – grey or with grey core – scarce sand and limestone – abundant forams – scarce magmatic or metamorphic rock fragments. Levantine whitish coated juglets
IV.TG 17
IV.TG 25

***1.3***: commonly brown – fine to medium – abundant limestone – scarce sand – some plagioclase. Levantine amphorae, coated jugs and pots, coated and uncoated jugs or juglets.
IV.TG 07
IV.TG 11
IV.TG 21
IV.TG 23
IV.TG 24
IV.TG 31

***1.4***: "talcose" light colour fabrics - fine – more limestone than sand – forams and sometimes muscovite. Cypriote amphorae, barrel-shaped jugs, jugs, jars, juglets and pots. Wares: White Painted, Black-on-Red II (IV) and Bichrome.
VI.TG 04
VI.TG 44

***1.5***: very compact and hard – abundant limestone. Levantine (Phoenician) amphorae, White Painted jugs or jars, bowls and juglets. Red slipped jugs, and probably Black-on-Red juglets and Bichrome IV bowls.
IV.TG 22 = Phoenician 04
IV.TG 37 = Phoenician 03
IV.TG 38 = Phoenician 02

***CLUSTER 2***: sandy or very sandy fabrics revealing the addition of this sediment as antiplastic material.

***2.1***: low compact fabrics - very fine to medium – very sandy and porous. Sinai or South Palestine coated and uncoated juglets, uncoated bowls with flat base, uncoated jugs and amphorae. Red coated jars, White Painted jars or juglets, uncoated amphorae with pointed base and Bichrome amphorae.
II.TG 08
II.TG 09
II.TG 10

***2.2***: very sandy and porous with scarce feldspar. Probably Chipriote and Levantine White Painted III barrel-shaped jugs, juglets, bowls and amphorae, uncoated probable jars with pointed base. Bichrome amphorae.
VI.TG 40
IV.TG 53

***2.3***: fine, partially oxidized – sandy groundmass with abundant quartz and feldspar. TG 42 with more abundant K- feldspars and plagioclasesharp grains. Cypriote. Black-on-Red I (III), II (IV) Gjerstad Type 3a,[45] III (V), and White Painted juglets. Coated bowls, jars, juglets and amphorae.
VI.TG 42
VI.TG 43

***2.4***: fine and medium, porous, more or less sandy with abundant non uniform inclusions. Feldspar, mica and fragments of rocks with black grit are present. Uncoated and coated jars and juglets, red slipped jars, juglets and bowls, white slipped amphorae and White Painted bowls sometimes with Bichrome interior surfaces. TG 49 is a probable Chipriote fabric in White Painted IV juglets, uncoated amphorae and jars and coated juglets or jugs. Black-on-Red II and White Painted II wares are also present.
VII.TG 46 (Chian)
VII.TG 48 (Samian)
VI.TG 49

***CLUSTER 3***: very fine and compact fabrics apparently without non plastic additives. Ochre particles, sand, limestone, mica and black inclusions may be present. TG 13 and TG 39 are sandy with scarce ochre particles. TG 41 and TG 45 are very fine, without a sandy groundmass revealing the employment of a different clay. Levantine and Aegean. TG 13 with red matte slip on the surfaces; TG 39, TG 41 and TG 45 in coated jars, juglets and pots, Black-on-Red I, II, III. TG 39 also in coated pilgrim flasks and Bichrome IV jugs.
IV.TG 13 = IV.Phoenician.05
VII.TG 39

[45] Gjerstad, *The Cypro-Geometric, Cypro-Archaic and Cypro-Classical Periods,* 69.

VII.TG 41
VII.TG 45

*Isolated fabrics*:
IV.TG 16: coarse and soft – abundant orange particles (fragments of sedimentary rocks). White Painted III jar.
IV.TG 18: soft and sandy fabric with non uniform limestone inclusions. "Torpedo" type amphorae.
IV.TG 27: uncommon hard and quite laminar fabric, similar to IV.TG 29.
IV.TG 35 (Phoenician 01): similar to Cluster 3 with scarce forams and red rounded particles. Red slipped pots.
II?TG 47: medium – porous – sandy. Pink and rounded translucent particles are characteristic. Uncoated bowls (probably "mortaria") and White Painted V amphorae.
IV.TG 57: fine – compact - very sandy - black particles, some grey inclusions and straw.
VII.TG 58: fine or coarse – hard – compact – sandy. Rounded and grey particles are characteristic. Black-on-Red II juglets and coated jars.
II?TG 59: very pale brown – medium – compact – light brown particles and straw. Very rare fabric assigned to a torpedo type amphora of latter time.
IV?TG 61: quite coarse – compact - light red fabric – sandy. Abundant non uniform orange particles, some limestone and black and grey particles.

Most of the imported pottery belongs to Levantine amphorae.[46] That is the case with IV.TG 51 and IV.TG 52 fabrics which are very common in this imported sample. Levantine fabrics are porous with abundant limestone particles, commonly rounded which contrast in brownish or reddish matrix. The textures are fine or medium, most of them compact and quite hard.

Less common are the Phoenician and Aegean vessels. VII.TG 39, TG 41 and TG 45 are the distinctive fabrics of small imported vessels (specially goblets and juglets). Typical TG 39 Aegean fabric is pink and very compact with a very fine sandy groundmass. As varieties of this group some fabrics may be red or grey with more ochre particles. IV.TG 13 (Phoenician 05) is a very infrequent fabric similar to VII.TG 39, but these scarce sherds have medium walls with red matte slip.

TG 41 and TG 45 Aegean fabrics are very fine and red with very scarce non plastic inclusions. Vessels mainly correspond to Black-on-Red I, II and III juglets and jugs, pots with whitish slip, red coated juglets and pots and coated pilgrim flasks. Also probable Aegean fabrics as the coarser TG 48 (Samian), TG 46 (Chian) and TG 58.

In relation to those fabric types not included in this report, most of them correspond to Egyptian non-local vessels in Marl $A_4$ fabric from Upper Egypt.[47] Marl $A_4$ groups TG 26 and TG 56 are frequent (15 %) and easily distinguishable by texture, colour and thin walls while TG 20 is a fine and pinkish fabric, very sandy with limestone like tiny dots, classified as Marl $A_4$ with limestone. TG 33 (Marl $A_4$ coarse) is a fine, talcose and low compact light yellowish fabric, quite similar to II.TG 08, II.TG 09 and II.TG 10. On the other hand TG 15 is a local fabric type Nile $B_1$ ("Vienna system") and TG 2 is another Nile fabric. TG 54 is similar to III. Mixed fabrics. TG 12, TG 14, TG 55, TG 56, TG 60 and TG 62 seem to be varieties of Marl F.[48] TG 28 is another Egyptian marl and TG 34 was eliminated, corresponding to burnt Nile fabrics. Finally, the Levantine sample TG 50 was included in the IV.TG 11 group because the

[46] Fuscaldo, *BCE* XXI, 6.
[47] Hamroush, *CCE* 3, 41.
[48] Aston, *Die Keramik des Grabungsplatzes Q I,* 94-95.

glossy appearance of some white inclusions were identified in thin sections as gypsum filling voids (secondary mineral), being the only difference registered between both fabrics.

This report must be considered an approach to a final fabric classification, the preliminary conclusions derived from the study in binocular microscope, combined with thin section analysis, is a first stage in our understanding about the complex commercial and social interactions which took place in Tell el-Ghaba along its occupation.[49] In this sense one aspect to be considered is the possibility that Egyptian marls were used in the manufacture of vessels which imitate imported styles suggesting the settling of foreign craftsmen or made by Egyptians potters on the basis of styles widely known by commercial trends. This hypothesis is supported by the abundance of apparent imported vessels in Marl F fabric. Future pottery analysis surely will refine and adjust current data, concerning the non-local vessels provenance in this frontier site placed next to the "Ways of Horus" at the beginning of the 26th Dynasty.

# Addenda

**Description of the vessels used for fabric analysis but not included in *Tell el-Ghaba I*[50]**

**No. 1: amphora** (Fig. 1:1), Inv. No. P0159A (Drawing No. 0185)

| | | | | | |
|---|---|---|---|---|---|
| Uncoated | II.TG 08 | $W_1$ + $Ha_2$ | --- | ox. | 3 |

Handle and wall fragment; oval in section; 1 [2]; single strap. Md: ca. 16.00 cm; Wd: 0.60 cm; $H_1$: 6.00 + x cm; Hd: 1.90 x 2.30 cm. 2.5Y 7/6 yellow. Break: 2.5Y 7/6 yellow. Smoothed.

**No. 2: jar** (Fig. 1:2), Inv. No. P0503A (Drawing No. 0203)

| | | | | | |
|---|---|---|---|---|---|
| WPMO | IV.TG 16 | $W_2$ | --- | ox. | 3 |

Body fragment. Md: 27.0 + x cm; Wd: 0.70 cm; $H_1$: 11.80 + x cm. 7.5YR 6/6 reddish yellow slip. Break: 7.5YR 6/6 reddish yellow. Throwing lines inside. Decoration: horizontally and circular painted lines and a crosslines pattern framed by vertical lines on the body, and a horizontal band below the neck,7.5YR 2.5/1 black. Polished, low lustre.

**No. 3: amphora** (Fig. 1:3), Inv. No. P0146A + P0150A (Drawing No. 0073)

| | | | | | |
|---|---|---|---|---|---|
| WPBI | IV.TG 51 (= TD IV.19) | $W_2$ | --- | ox. | 3 |

Body sherd. Md: ca. 36.00 cm; Wd: 0.75 cm; $H_1$: 12.35 + x cm. 5YR 6/8 reddish yellow slip. Break: 5YR 7/6-8 reddish yellow. Throwing lines on the interior and exterior. Decoration: horizontally painted lines, 5YR 4/1 dark grey and 10YR 4/6 red. Polished; medium lustre.

**No. 4: amphora** (Fig. 1:4), Inv. No. P0566A (Drawing No. 0238)

| | | | | | |
|---|---|---|---|---|---|
| Uncoated | IV.TG 07 | $W_2$ | --- | ox. | 3 |

Shoulder fragment; "torpedo" type. Md: ca. 24.00 cm; Wd: 0.75 cm; $H_1$: 3.60 + x cm. 10YR 7/3 very pale brown. Break: 10YR 7/4 very pale brown. Throwing lines inside; smoothed on the wheel.

**No. 5: amphora** (Fig. 1:5), Inv. No. P1064A (Drawing No. 0655)

| | | | | | |
|---|---|---|---|---|---|
| Uncoated | IV.TG 18 | $W_2$ | --- | me. | 3 |

Rim sherd; vertical direct rim, thickened. Rd: 11.00 cm 1/8; Wd: 0.80 cm; $H_1$: 2.30 + x cm.

[49] Fuscaldo, Basílico, Cremonte and Lupo, "A Preliminary Report on the Pottery from Tell el-Ghaba, a Saite Settlement in North Sinai", 189-194.

[50] Catalogue prepared by Perla Fuscaldo. See *Tell el-Ghaba III* (forthcoming).

2.5YR 5/6 red. Break: 2.5YR 4/1 dark grey core; 2.5YR 5/6 red oxidation zones. Throwing lines inside; smoothed on the wheel.

**No. 6: amphora** (Fig. 1:6), Inv. No. P1094A (Drawing No. 0464)

| | | | | | |
|---|---|---|---|---|---|
| WS | IV.TG 29 | $W_2$ | --- | me. | 3 |

Rim sherd; inverted direct rim. Rd: 10.00 cm 3/32; Wd: 0.70 cm; $H_1$: 2.60 + x cm. 2.5Y 8/3 pale yellow slip. Break: 10YR 7/4 very pale brown core; 5YR 7/6 reddish yellow inside and outside. Throwing lines inside; smoothed on the wheel.

**No. 7: deep bowl** (Fig. 1:7), Inv. No. P0703A (Drawing No. 0655)

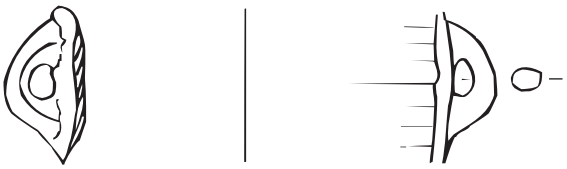
| | | | | | |
|---|---|---|---|---|---|
| RPMO | VI.TG 49 | $Ha_2 + W_2$ | --- | ox. | 3 |

Handle and wall fragment; horizontal handle, [ring base]. Rd: ca. 30.00 cm; Wd: 0.40 cm; $H_1$: 4.50 + x cm; Hd: 0.80 x 0.80 cm. 2.5YR 6/6 light red slip. Break: 5YR 5/6 yellowish red. Handle placed horizontally, fixed to the body; ring base? Decoration: painted on the rim and handle, 5YR 3/4 dark reddish brown. Polished; low lustre (*from Area III, L2001*. This locus is similar to L0001 and L1001).

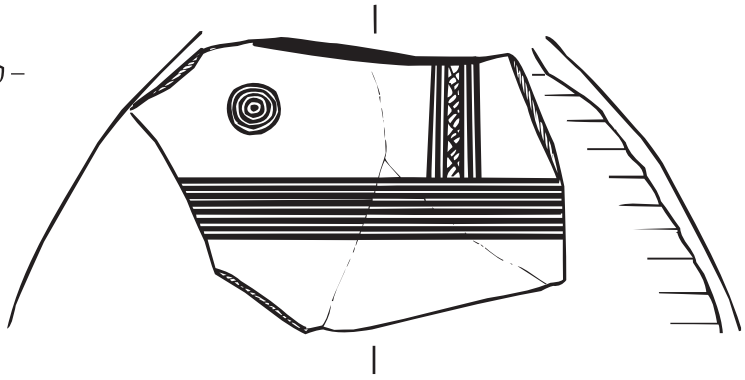
**No. 8: amphora** (Fig. 1:8), Inv. No. P0882A (before Inv. No. P0093A. Drawing No. 0232)

| | | | | | |
|---|---|---|---|---|---|
| WS | VI.TG 04 | $W_2$ | --- | ox. | 2-3 |

Rim and neck fragment; inverted direct rim. Rd: 10.00 cm; Nd: 11.30 cm; Wd: 0.65 cm; $H_1$: 1.53 + x cm. 7.5YR 7/4 pink slip. Break: 7.5YR 7/4 pink. Smoothed on the wheel.



No. 1 P0159A, L0009



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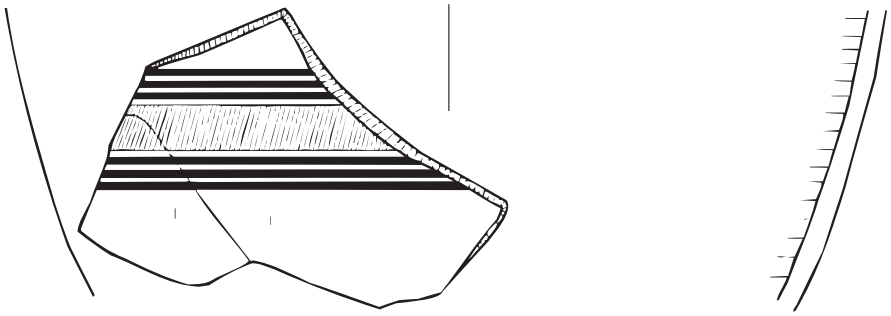
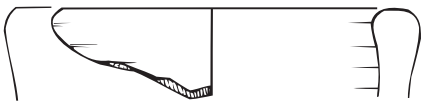
No. 4 P0566A, L0057



No. 3 P0146A + P0150A, L0033

0 3cm



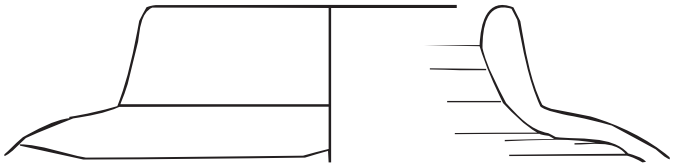
No. 5 P1064A, L1089

No. 6 P1094A, L0162

0 2cm

No. 7 P0703A, L2001

0 3cm



No. 8 P0882A, L0171

0 2cm

Fig.1

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**Plate I:** Photomicrographs (10 x)

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| Plate I:2. Group TG 03 | Plate I:18. Group TG 04 | Plate I:34. Group TG 49 |
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*Photographs taken by Beatriz Cremonte and digitalised by Perla Fuscaldo

Plate 1:1 Group TG 01

Plate 1:2 Group TG 03

Plate 1:3 Group TG 05

Plate 1:4 Group TG 06

Plate 1:5 Group TG 19

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Plate 1:12 Group TG 07

Plate 1:13 Group TG 11

Plate 1:14 Group TG 31

Plate 1:15 Group TG 23

Plate 1:16 Group TG 24

Plate 1:17 Group TG 21

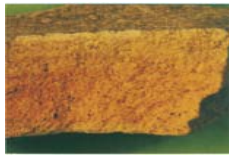
Plate 1:18 Group TG 04

Plate 1:19 Group TG 44

Plate 1:20 Group TG 22

Plate 1:21 Group TG 37

Plate 1:22 Group TG 38

Plate 1:23 Group TG 29

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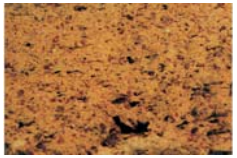
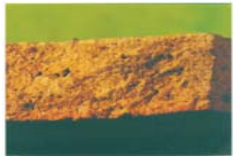


Plate 1:25 Group TG 47

Plate 1:26 Group TG 08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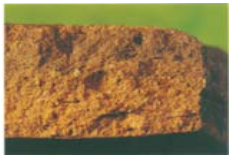


Plate 1:28 Group TG10

Plate 1:29 Group TG 40

Plate 1:30 Group TG 53

Plate 1:31 Group TG 42

Plate 1:32 Group TG 43

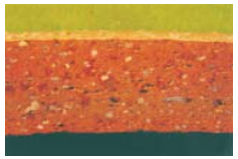


Plate 1:33 Group TG 46

Plate 1:34 Group TG 49

Plate 1:35 Group TG 48

Plate 1:36 Group TG 39

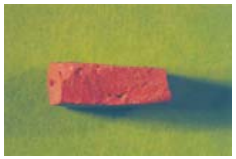


Plate 1:37 Group TG 41

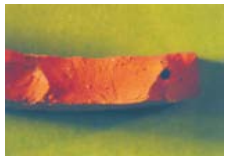
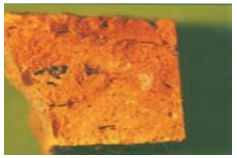


Plate 1:38 Group TG 45

Plate 1:39 Group TG 13

Plate 1:40 Group TG 16

Plate 1:41 Group TG 27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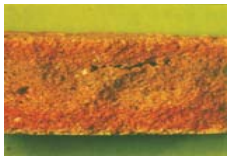
Plate 1:43 Group TG 57

Plate 1:44 Group TG 59

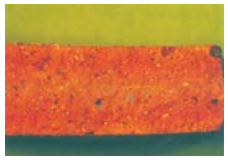
Plate 1:45 Group TG 58

Plate 1:46 Group TG 61

Plate 1

# List of Tables

Table I*: Plates of non-local fabrics
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* Tables made by the editor.

**TABLE I: PLATES OF NON-LOCAL FABRICS**

| Plate | Fabric group | Final fabric classification | Lab reference | Field reference |
|---|---|---|---|---|
| Plate I: 1. | Group 01 | IV.TG 01 | Inv. No. P1189A | Area II, L1102 |
| Plate I: 2 | Group 03 | IV.TG 03 | Inv. No. P1069A | Area I, L0001 |
| Plate I: 3 | Group 05 | IV.TG 05 | Inv. No. P1082A | Area II, L1001 |
| Plate I: 4 | Group 06 | IV.TG 06 | Inv. No. P1280A | Area II, L1060 |
| Plate I: 5 | Group 19 | IV.TG 19 | Inv. No. C-0134 (sample 7) | Area II, BB/43, sondage |
| Plate I: 6 | Group 32 | IV.TG 32 | Inv. No. C-0379 | Area I, L0001 |
| Plate I: 7 | Group 51 | IV.TG 51 | Inv. No. P0146A + P0150A | Area I, L0033 + L0004 |
| Plate I: 8 | Group 52 | IV.TG 52 | Inv. No. P0883A | Area I, L0001 |
| Plate I: 9 | Group 36 | IV.TG 36 | Inv. No. P0761A | Area I, L0040 |
| Plate I: 10 | Group 17 | IV.TG 17 | Inv. No. P0522A | Area I, L0030 |
| Plate I: 11 | Group 25 | IV.TG 25 | Inv. No. C-0413 [008] | Area I, L0254 |
| Plate I: 12 | Group 07 | IV.TG 07 | Inv. No. P0566A | Area I, L0057 |
| Plate I: 13 | Group 11 | IV.TG 11 | Inv. No. P1288A | Area I, L0001 |
| Plate I: 14 | Group 31 | IV.TG 31 | Inv. No. P1103A | Area VI, L0507 |
| Plate I: 15 | Group 23 | IV.TG 23 | Inv. No. P0381A | Area I, L0001 |
| Plate I: 16 | Group 24 | IV.TG 24 | Inv. No. P1295A | Area I, L0001 |
| Plate I: 17 | Group 21 | IV.TG 21 | Inv. No. C-1103 (5) (sample 2) | Area II, L1033 |
| Plate I: 18 | Group 04 | VI.TG 04 | Inv. No. P0882A | Area I, L0171 |
| Plate I: 19 | Group 44 | VI.TG 44 | Inv. No. C-0243 [002] | Area I, L0079 |
| Plate I: 20 | Group 22 | IV.TG 22 = Phoenician.04 | Inv. No. C-0200 [010] | Area I, L0084 |
| Plate I: 21 | Group 37 | IV.TG 37 = Phoenician.03 | Inv. No. P0511A | Area I, BB/43, sondage |
| Plate I: 22 | Group 38 | IV.TG 38 = Phoenician.02 | Inv. No. P0125A | Area I, L0033 |
| Plate I: 23 | Group 29 | IV.TG 29 | Inv. No. P1094A | Area I, L0162 |
| Plate I: 24 | Group 18 | IV.TG 18 | Inv. No. P1064A | Area II, L1089 |
| Plate I: 25 | Group 47 | II?TG 47 | Inv. No. P0380A | Area I, L0007 |
| Plate I: 26 | Group 08 | II.TG 08 | Inv. No. P0159A | Area I, L0009 |
| Plate I: 27 | Group 09 | II.TG 09 | Inv. No. P2006A | Area I, L0289 |
| Plate I: 28 | Group 10 | II.TG 10 | Inv. No. P1230A | Area I, L0040 |
| Plate I: 29 | Group 40 | VI.TG 40 | Inv. No. P0755A | Area II, L1001 |
| Plate I: 30 | Group 53 | IV.TG 53 | Inv. No. P0133A | Area I, L0057 |
| Plate I: 31 | Group 42 | VI.TG 42 | Inv. No. P0374A | Area II, L1001 |
| Plate I: 32 | Group 43 | VI.TG 43 | Inv. No. P0394A | Area I, L0001 |
| Plate I: 33 | Group 46 | VII.TG 46 (Chian) | Inv. No. P0048A + P0392A | Area I, L0001 |
| Plate I: 34 | Group 49 | VI.TG 49 | Inv. No. P0703A | Area III, L2001 |
| Plate I: 35 | Group 48 | VII.TG 48 (Samian) | Inv. No. P0712A | Area I, L0001 |
| Plate I: 36 | Group 39 | VII.TG 39 | Inv. No. P1185A | Area II, L1185 |
| Plate I: 37 | Group 41 | VII.TG 41 | Inv. No. P0193A | Area I, L0156 |
| Plate I: 38 | Group 45 | VII.TG 45 | Inv. No. P0710A | Area I, L0289 |
| Plate I: 39 | Group 13 | IV.TG 13= Phoenician.05 | Inv. No. P0124A | Area I, L0113 |
| Plate I: 40 | Group 16 | IV.TG 16 | Inv. No. P0503A | Area I, L0056 |
| Plate I: 41 | Group 27 | IV.TG 27 | Inv. No. C-0010 (sample 1) | Area I, L0008 |
| Plate I: 42 | Group 35 | IV.TG 35 = Phoenician.01 | Inv. No. P1244A | Area I, L0271 |
| Plate I: 43 | Group 57 | IV.TG 57 | Inv. No. P1193A | Area I, L0017 |
| Plate I: 44 | Group 59 | II?TG 59 | Inv. No. P2042A | Area VI, L0546 |
| Plate I: 45 | Group 58 | VII.TG 58 | Inv. No. P0785A | Area II, L1126 |
| Plate I: 46 | Group 61 | IV.TG 61 | Inv. No. C-0138 (sample 1) | Area I, L0077 |

**TABLE II: NON-LOCAL FABRIC GROUPS**

| Fabric group | Plate | Final fabric classification | Lab reference | Field reference |
|---|---|---|---|---|
| Group 01 | Plate I: 1 | IV.TG 01 | Inv. No. P1189A | Area II, L1102 |
| Group 03 | Plate I: 2 | IV.TG 03 | Inv. No. P1069A | Area I, L0001 |
| Group 04 | Plate I: 18 | VI.TG 04 | Inv. No. P0882A | Area I, L0171 |
| Group 05 | Plate I: 3 | IV.TG 05 | Inv. No. P1082A | Area II, L1001 |
| Group 06 | Plate I: 4 | IV.TG 06 | Inv. No. P1280A | Area II, L1060 |
| Group 07 | Plate I: 12 | IV.TG 07 | Inv. No. P0566A | Area I, L0057 |
| Group 08 | Plate I: 26 | II.TG 08 | Inv. No. P0159A | Area I, L0009 |
| Group 09 | Plate I: 27 | II.TG 09 | Inv. No. P2006A | Area I, L0289 |
| Group 10 | Plate I: 28 | II.TG 10 | Inv. No. P1230A | Area I, L0040 |
| Group 11 | Plate I: 13 | IV.TG 11 | Inv. No. P1288A | Area I, L0001 |
| Group 13 | Plate I: 39 | IV.TG 13= Phoenician.05 | Inv. No. P0124A | Area I, L0113 |
| Group 16 | Plate I: 40 | IV.TG 16 | Inv. No. P0503A | Area I, L0056 |
| Group 17 | Plate I: 10 | IV.TG 17 | Inv. No. P0522A | Area I, L0030 |
| Group 18 | Plate I: 24 | IV.TG 18 | Inv. No. P1064A | Area II, L1089 |
| Group 19 | Plate I: 5 | IV.TG 19 | Inv. No. C-0134 (sample 7) | Area II, BB/43, sondage |
| Group 21 | Plate I: 17 | IV.TG 21 | Inv. No. C-1103 (5) (sample 2) | Area II, L1033 |
| Group 22 | Plate I: 20 | IV.TG 22 = Phoenician.04 | Inv. No. C-0200 [010] | Area I, L0084 |
| Group 23 | Plate I: 15 | IV.TG 23 | Inv. No. P0381A | Area I, L0001 |
| Group 24 | Plate I: 16 | IV.TG 24 | Inv. No. P1295A | Area I, L0001 |
| Group 25 | Plate I: 11 | IV.TG 25 | Inv. No. C-0413 [008] | Area I, L0254 |
| Group 27 | Plate I: 41 | IV.TG 27 | Inv. No. C-0010 (sample 1) | Area I, L0008 |
| Group 29 | Plate I: 23 | IV.TG 29 | Inv. No. P1094A | Area I, L0162 |
| Group 31 | Plate I: 14 | IV.TG 31 | Inv. No. P1103A | Area VI, L0507 |
| Group 32 | Plate I: 6 | IV.TG 32 | Inv. No. C-0379 | Area I, L0001 |
| Group 35 | Plate I: 42 | IV.TG 35 = Phoenician.01 | Inv. No. P1244A | Area I, L0271 |
| Group 36 | Plate I: 9 | IV.TG 36 | Inv. No. P0761A | Area I, L0040 |
| Group 37 | Plate I: 21 | IV.TG 37 = Phoenician.03 | Inv. No. P0511A | Area I, BB/43, sondage |
| Group 38 | Plate I: 22 | IV.TG 38 = Phoenician.02 | Inv. No. P0125A | Area I, L0033 |
| Group 39 | Plate I: 36 | VII.TG 39 | Inv. No. P1185A | Area II, L1185 |
| Group 40 | Plate I: 29 | VI.TG 40 | Inv. No. P0755A | Area II, L1001 |
| Group 41 | Plate I: 37 | VII.TG 41 | Inv. No. P0193A | Area I, L0156 |
| Group 42 | Plate I: 31 | VI.TG 42 | Inv. No. P0374A | Area II, L1001 |
| Group 43 | Plate I: 32 | VI.TG 43 | Inv. No. P0394A | Area I, L0001 |
| Group 44 | Plate I: 19 | VI.TG 44 | Inv. No. C-0243 [002] | Area I, L0079 |
| Group 45 | Plate I: 38 | VII.TG 45 | Inv. No. P0710A | Area I, L0289 |
| Group 46 | Plate I: 33 | VII.TG 46 (Chian) | Inv. No. P0048A + P0392A | Area I, L0001 |
| Group 47 | Plate I: 25 | II?TG 47 | Inv. No. P0380A | Area I, L0007 |
| Group 48 | Plate I: 35 | VII.TG 48 (Samian) | Inv. No. P0712A | Area I, L0001 |
| Group 49 | Plate I: 34 | VI.TG 49 | Inv. No. P0703A | Area III, L2001 |
| Group 51 | Plate I: 7 | IV.TG 51 | Inv. No. P0146A + P0150A | Area I, L0033 + L0004 |
| Group 52 | Plate I: 8 | IV.TG 52 | Inv. No. P0883A | Area I, L0001 |
| Group 53 | Plate I: 30 | IV.TG 53 | Inv. No. P0133A | Area I, L0057 |
| Group 57 | Plate I: 43 | IV.TG 57 | Inv. No. P1193A | Area I, L0017 |
| Group 58 | Plate I: 45 | VII.TG 58 | Inv. No. P0785A | Area II, L1126 |
| Group 59 | Plate I: 44 | II?TG 59 | Inv. No. P2042A | Area VI, L0546 |
| Group 61 | Plate I: 46 | IV.TG 61 | Inv. No. C-0138 (sample 1) | Area I, L0077 |

**TABLE III: NON-LOCAL FABRICS, FINAL CLASSIFICATION**

| Final fabric classification | Plate | Fabric group | Lab reference | Field reference |
|---|---|---|---|---|
| IV.TG 01 | Plate I: 1. | Group 01 | Inv. No. P1189A | Area II, L1102 |
| IV.TG 03 | Plate I: 2 | Group 03 | Inv. No. P1069A | Area I, L0001 |
| VI.TG 04 | Plate I: 18 | Group 04 | Inv. No. P0882A | Area I, L0171 |
| IV.TG 05 | Plate I: 3 | Group 05 | Inv. No. P1082A | Area II, L1001 |
| IV.TG 06 | Plate I: 4 | Group 06 | Inv. No. P1280A | Area II, L1060 |
| IV.TG 07 | Plate I: 12 | Group 07 | Inv. No. P0566A | Area I, L0057 |
| II.TG 08 | Plate I: 26 | Group 08 | Inv. No. P0159A | Area I, L0009 |
| II.TG 09 | Plate I: 27 | Group 09 | Inv. No. P2006A | Area I, L0289 |
| II.TG 10 | Plate I: 28 | Group 10 | Inv. No. P1230A | Area I, L0040 |
| IV.TG 11 | Plate I: 13 | Group 11 | Inv. No. P1288A | Area I, L0001 |
| IV.TG 13= Phoenician.05 | Plate I: 39 | Group 13 | Inv. No. P0124A | Area I, L0113 |
| IV.TG 16 | Plate I: 40 | Group 16 | Inv. No. P0503A | Area I, L0056 |
| IV.TG 17 | Plate I: 10 | Group 17 | Inv. No. P0522A | Area I, L0030 |
| IV.TG 18 | Plate I: 24 | Group 18 | Inv. No. P1064A | Area II, L1089 |
| IV.TG 19 | Plate I: 5 | Group 19 | Inv. No. C-0134 (sample 7) | Area II, BB/43, sondage |
| IV.TG 21 | Plate I: 17 | Group 21 | Inv. No. C-1103 (5) (sample 2) | Area II, L1033 |
| IV.TG 22 = Phoenician.04 | Plate I: 20 | Group 22 | Inv. No. C-0200 [010] | Area I, L0084 |
| IV.TG 23 | Plate I: 15 | Group 23 | Inv. No. P0381A | Area I, L0001 |
| IV.TG 24 | Plate I: 16 | Group 24 | Inv. No. P1295A | Area I, L0001 |
| IV.TG 25 | Plate I: 11 | Group 25 | Inv. No. C-0413 [008] | Area I, L0254 |
| IV.TG 27 | Plate I: 41 | Group 27 | Inv. No. C-0010 (sample 1) | Area I, L0008 |
| IV.TG 29 | Plate I: 23 | Group 29 | Inv. No. P1094A | Area I, L0162 |
| IV.TG 31 | Plate I: 14 | Group 31 | Inv. No. P1103A | Area VI, L0507 |
| IV.TG 32 | Plate I: 6 | Group 32 | Inv. No. C-0379 | Area I, L0001 |
| IV.TG 35 = Phoenician.01 | Plate I: 42 | Group 35 | Inv. No. P1244A | Area I, L0271 |
| IV.TG 36 | Plate I: 9 | Group 36 | Inv. No. P0761A | Area I, L0040 |
| IV.TG 37 = Phoenician.03 | Plate I: 21 | Group 37 | Inv. No. P0511A | Area I, BB/43, sondage |
| IV.TG 38 = Phoenician.02 | Plate I: 22 | Group 38 | Inv. No. P0125A | Area I, L0033 |
| VII.TG 39 | Plate I: 36 | Group 39 | Inv. No. P1185A | Area II, L1185 |
| VI.TG 40 | Plate I: 29 | Group 40 | Inv. No. P0755A | Area II, L1001 |
| VII.TG 41 | Plate I: 37 | Group 41 | Inv. No. P0193A | Area I, L0156 |
| VI.TG 42 | Plate I: 31 | Group 42 | Inv. No. P0374A | Area II, L1001 |
| VI.TG 43 | Plate I: 32 | Group 43 | Inv. No. P0394A | Area I, L0001 |
| VI.TG 44 | Plate I: 19 | Group 44 | Inv. No. C-0243 [002] | Area I, L0079 |
| VII.TG 45 | Plate I: 38 | Group 45 | Inv. No. P0710A | Area I, L0289 |
| VII.TG 46 (Chian) | Plate I: 33 | Group 46 | Inv. No. P0048A + P0392A | Area I, L0001 |
| II?TG 47 | Plate I: 25 | Group 47 | Inv. No. P0380A | Area I, L0007 |
| VII.TG 48 (Samian) | Plate I: 35 | Group 48 | Inv. No. P0712A | Area I, L0001 |
| VI.TG 49 | Plate I: 34 | Group 49 | Inv. No. P0703A | Area III, L2001 |
| IV.TG 51 | Plate I: 7 | Group 51 | Inv. No. P0146A + P0150A | Area I, L0033 + L0004 |
| IV.TG 52 | Plate I: 8 | Group 52 | Inv. No. P0883A | Area I, L0001 |
| IV.TG 53 | Plate I: 30 | Group 53 | Inv. No. P0133A | Area I, L0057 |
| IV.TG 57 | Plate I: 43 | Group 57 | Inv. No. P1193A | Area I, L0017 |
| VII.TG 58 | Plate I: 45 | Group 58 | Inv. No. P0785A | Area II, L1126 |
| II?TG 59 | Plate I: 44 | Group 59 | Inv. No. P2042A | Area VI, L0546 |
| IV.TG 61 | Plate I: 46 | Group 61 | Inv. No. C-0138 (sample 1) | Area I, L0077 |

**TABLE IV: LAB REFERENCES OF NON-LOCAL FABRICS**

| Lab reference | Plate | Fabric group | Final fabric classification | Field reference |
|---|---|---|---|---|
| Inv. No. C-0010 (sample 1) | Plate I: 41 | Group 27 | IV.TG 27 | Area I, L0008 |
| Inv. No. C-0134 (sample 7) | Plate I: 5 | Group 19 | IV.TG 19 | Area II, BB/43, sondage |
| Inv. No. C-0138 (sample 1) | Plate I: 46 | Group 61 | IV.TG 61 | Area I, L0077 |
| Inv. No. C-0200 [010] | Plate I: 20 | Group 22 | IV.TG 22 = Phoenician.04 | Area I, L0084 |
| Inv. No. C-0243 [002] | Plate I: 19 | Group 44 | VI.TG 44 | Area I, L0079 |
| Inv. No. C-0379 | Plate I: 6 | Group 32 | IV.TG 32 | Area I, L0001 |
| Inv. No. C-0413 [008] | Plate I: 11 | Group 25 | IV.TG 25 | Area I, L0254 |
| Inv. No. C-1103 (5) (sample 2) | Plate I: 17 | Group 21 | IV.TG 21 | Area II, L1033 |
| Inv. No. P0048A + P0392A | Plate I: 33 | Group 46 | VII.TG 46 (Chian) | Area I, L0001 |
| Inv. No. P0124A | Plate I: 39 | Group 13 | IV.TG 13= Phoenician.05 | Area I, L0113 |
| Inv. No. P0125A | Plate I: 22 | Group 38 | IV.TG 38 = Phoenician.02 | Area I, L0033 |
| Inv. No. P0133A | Plate I: 30 | Group 53 | IV.TG 53 | Area I, L0057 |
| Inv. No. P0146A + P0150A | Plate I: 7 | Group 51 | IV.TG 51 | Area I, L0033 + L0004 |
| Inv. No. P0159A | Plate I: 26 | Group 08 | II.TG 08 | Area I, L0009 |
| Inv. No. P0193A | Plate I: 37 | Group 41 | VII.TG 41 | Area I, L0156 |
| Inv. No. P0374A | Plate I: 31 | Group 42 | VI.TG 42 | Area II, L1001 |
| Inv. No. P0380A | Plate I: 25 | Group 47 | II?TG 47 | Area I, L0007 |
| Inv. No. P0381A | Plate I: 15 | Group 23 | IV.TG 23 | Area I, L0001 |
| Inv. No. P0394A | Plate I: 32 | Group 43 | VI.TG 43 | Area I, L0001 |
| Inv. No. P0503A | Plate I: 40 | Group 16 | IV.TG 16 | Area I, L0056 |
| Inv. No. P0511A | Plate I: 21 | Group 37 | IV.TG 37 = Phoenician.03 | Area I, BB/43, sondage |
| Inv. No. P0522A | Plate I: 10 | Group 17 | IV.TG 17 | Area I, L0030 |
| Inv. No. P0566A | Plate I: 12 | Group 07 | IV.TG 07 | Area I, L0057 |
| Inv. No. P0703A | Plate I: 34 | Group 49 | VI.TG 49 | Area III, L2001 |
| Inv. No. P0710A | Plate I: 38 | Group 45 | VII.TG 45 | Area I, L0289 |
| Inv. No. P0712A | Plate I: 35 | Group 48 | VII.TG 48 (Samian) | Area I, L0001 |
| Inv. No. P0755A | Plate I: 29 | Group 40 | VI.TG 40 | Area II, L1001 |
| Inv. No. P0761A | Plate I: 9 | Group 36 | IV.TG 36 | Area I, L0040 |
| Inv. No. P0785A | Plate I: 45 | Group 58 | VII.TG 58 | Area II, L1126 |
| Inv. No. P0882A | Plate I: 18 | Group 04 | VI.TG 04 | Area I, L0171 |
| Inv. No. P0883A | Plate I: 8 | Group 52 | IV.TG 52 | Area I, L0001 |
| Inv. No. P1064A | Plate I: 24 | Group 18 | IV.TG 18 | Area II, L1089 |
| Inv. No. P1069A | Plate I: 2 | Group 03 | IV.TG 03 | Area I, L0001 |
| Inv. No. P1082A | Plate I: 3 | Group 05 | IV.TG 05 | Area II, L1001 |
| Inv. No. P1094A | Plate I: 23 | Group 29 | IV.TG 29 | Area I, L0162 |
| Inv. No. P1103A | Plate I: 14 | Group 31 | IV.TG 31 | Area VI, L0507 |
| Inv. No. P1185A | Plate I: 36 | Group 39 | VII.TG 39 | Area II, L1185 |
| Inv. No. P1189A | Plate I: 1. | Group 01 | IV.TG 01 | Area II, L1102 |
| Inv. No. P1193A | Plate I: 43 | Group 57 | IV.TG 57 | Area I, L0017 |
| Inv. No. P1230A | Plate I: 28 | Group 10 | II.TG 10 | Area I, L0040 |
| Inv. No. P1244A | Plate I: 42 | Group 35 | IV.TG 35 = Phoenician.01 | Area I, L0271 |
| Inv. No. P1280A | Plate I: 4 | Group 06 | IV.TG 06 | Area II, L1060 |
| Inv. No. P1288A | Plate I: 13 | Group 11 | IV.TG 11 | Area I, L0001 |
| Inv. No. P1295A | Plate I: 16 | Group 24 | IV.TG 24 | Area I, L0001 |
| Inv. No. P2006A | Plate I: 27 | Group 09 | II.TG 09 | Area I, L0289 |
| Inv. No. P2042A | Plate I: 44 | Group 59 | II?TG 59 | Area VI, L0546 |

# The Last Days of Tell el-Ghaba: The Ceramic Evidence

**Abstract**

The Egyptian and imported pottery from the destruction layer L0001 and L1001 are included in this ceramic analysis, with a short morphologic and stylistic description of the vessels, and the comparison with material from other sites of Egypt, the Levant and the Eastern Mediterranean. The destruction layer, which covered the whole excavated area, [1] is a dark, charcoal-rich sediment with oxidation lenses, characteristic of a conflagration layer.[2] Abundant ceramic remains, fragmentary and eroded, were recovered. [3]

## I.- The Egyptian pottery

**by Silvia Lupo***

The conflagration layer L0001[4] and L1001[5] includes a great amount of Egyptian pottery, being the most representative pottery at the site. We will refer to the Egyptian material[6] coming from this destruction level in the mentioned areas.

The Egyptian fine ware is represented almost exclusively by juglets in Nile silt clay and in marl clay. One of them in Nile clay is a globular-shaped juglet with its handle attached from neck to body, red-slipped and polished (No.1**,** Inv. No. P0624A). This juglet is similar to another Nile $B_2$ juglet (No. 2, Inv. No. P0001) in Area II, L1058.[7] They differ in decoration and base shape. Inv. No. P0001A has three horizontally black painted lines in the upper body and it is ring-based ($R_3$), and Inv. No. P0624A has no decoration at all. However both necks are of Phoenician tradition similar to an imported juglet found in Building B (Area I, Level V, L0016, Inv. No. P0040A).[8] Both juglets are similar to those found at Carmel and Tell el-'Ajjul.[9] A similar neck was made in Marl F, an imitation of the same kind of Phoenician juglets (No.3**,** Inv No. P7019A).

A globular-shaped juglet (No. 4**,** Inv. No. P1057A) made of Nile $E_2$ preserves its ring base ($R_3$).[10] A parallel in marl clay was found at Saqqara dated to the Late Dynastic Period. It is also red-slipped and burnished and shows the scar of the only handle on the shoulder.[11]

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* DEGIP-IMHICIHU-CONICET, Buenos Aires.

[1] This locus is called L0001 in Area I, L10001 in Areas II and VI, L2001 in Area III and L5001 in Area V.

[2] Crivelli Montero, "Stratigraphy Area I", in Fuscaldo (ed.) *Tell el-Ghaba I,* 50 ff.

[3] Basílico and Lupo, in *Proceedings of the 9th International Congress of Egyptologists*, 135-144.

[4] Basílico and Lupo, "The Final Stage and Abandonment of Tell el-Ghaba, North Sinai: a Site on the Egyptian Border", in Goyon-Cardin (eds.), *Proceedings of the IXth International Congress of Egyptologists. Grenoble, 6-12/9/2004.*

[5] See Crivelli, "Stratigraphy Area I", in Fuscaldo (ed.), *Tell el-Ghaba I*, 50.

[6] See measures of the vessels in Fuscaldo (ed.), *Tell el-Ghaba I*, passim.

[7] Lupo and Basílico, 'Tell el-Ghaba, norte de Sinaí: los contextos del Área II y su problemática", in Basílico and Lupo (eds.), *Tell el-Ghaba, norte de Sinaí, Egipto. Alimentación, producción e intercambio*, 95-96, Fig. 3:1.

[8] IV.TG 37.

[9] Amiran, *Ancient Pottery of the Holy Land. From the Beginnings in the Neolithic to the End of the Iron Age*, 286, Plate 97; Basílico, "La cerámica importada de Tell el-Ghaba, norte de Sinaí, Egipto. Interacciones locales y regionales durante la época saíta"; Lupo and Basílico, "Tell el-Ghaba, norte de Sinaí: los contextos del Área II y su problemática", in Basílico and Lupo (eds.), *Tell el-Ghaba, norte de Sinaí, Egipto. Alimentación, producción e intercambio*, 95-96.

[10] Bd: 3.00 cm.

[11] French and Ghaly, "Pottery chiefly of the Late Dynastic Period, from the Excavations by the Egyptian Antiquities Organisation at Saqqara, 1987", *CCE* 2 (1991), 93-124, specially 108.38, No.38.

There is another globular-shaped juglet (No. 5, Inv. No. P1237A) and a rounded-base juglet (No. 6, Inv. No. P1111A), both made of Nile $E_2$, the last completely smoked. Among the globular juglets in Nile $E_2$, two of them are also ring-based but hand-made (No. 7, Inv. No. P0077A and No. 8, Inv. No. P0142A). They seem to be votive juglets, as a small pot in Nile $B_2$ (No. 9, Inv. No. P 0013A). From L1001 it is preserved a red polished juglet that preserved a rolled handle in Nile $E_2$ (Inv. No. P7021A), and a rim made of Marl F (No. 10, Inv. No. P7032A) that is similar to Phoenician juglets.

Among the Egyptian household ware in Nile clay large bowls, bowls, jars, amphorae, storage jars, lids, bakery trays and "pigeon pots" are very abundant.

Some large bowls made of Nile $C_2$ and of Nile $B_2$ show decorated rims (No. 11, Inv. No.P1012A and No. 12, Inv No. P7060A). We have not found any similar vessels in other contexts. A bowl in Nile $B_2$, No. 13, Inv. No. P0637A, is similar to that depicted by Defernez in a Saite context at Karnak.[12]

Some shallow bowls are similar to others found at Tell el-Maskhuta, dated to the Early Saite period.[13] Some of them in Nile $B_2$ are characterised by flattened flanged rims (No. 14, Inv. No. C-0521 [081]) and are similar to those from Tell el-Maskhuta.[14] In these cases the rim slopes downwards from interior to exterior.[15]

Carinated bowls in Nile clay are also present at Tell el-Ghaba. One of them made of Nile $E_1$ (No. 15, Inv. No. C-0380 [095]) has a parallel at Heracleopolis Magna.[16] It is a very common bowl dated to the end of the VIIIth century BC to the middle of the VIIth century BC (730/700- ca. 650 BC), during the 25$^{th}$ and 26$^{th}$ Dynasty.[17] Other bowl (No. 16, Inv. No. C-0521 [036]) is similar to another in Nile $B_2$ illustrated by Aston[18] and depicted as a bowl with modelled rim and ring-base ascribed to Phase V (575/550-c. 400? BC).[19] Saite are also No. 17, Inv. No. C-1172 [003], No. 18, Inv. No. C-0084 [005], No. 19, Inv. No. 0521 [052], No. 20, Inv. No. C-0374 [001] all made of Nile $B_2$ and No. 21, Inv. No. C-0521 [061] in Nile $C_1$. The bowl No. 22, Inv. No. C-0380 [074] shows a carination below the rim where the profile makes a sharp turn from its downward descent to become more horizontally inclined.

A different kind of fine ware is a carinated bowl (No. 23, Inv. Nº P1062A) made of Nile $B_2$, red polished that can be paralleled to one depicted by Aston as carinated bowl with red slipped rim on uncoated ware that he ascribes to Phase III (c.775/725-c.650/625 BC)[20] and has remained in later times, as at Tell el-Ghaba.[21]

In Marl F, a small carinated shallow bowl or model platter is unique at Tell el-Ghaba. Studies carried out on Saite material coming from other sites has allowed us to recognize that at the site imitations of alluvial or imported vessels in this local fabric were made (No. 24, Inv. No. C-0379 [031]). Aston records a platter made of Nile $C_1$ at Elephantine dated to Phase V, as Brissaud at Sân el-Hagar, and French and Ghaly at Saqqara, also in Nile clay.[22]

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[12] Defernez, *BCE* XXII (2004), 46, Fig. 16.

[13] Paice, *BES* 8 (1986-1987), Fig. 3, No. 1-8.

[14] Paice, *BES* 8 (1986-1987), Fig. 3, No. 8.

[15] Paice, *BES* 8 (1986-1987), Fig. 3, No. 1-8, 10 and 11.

[16] López Grande-Quesada Sanz, "La cerámica", in *Excavaciones en Ehnasya el-Medina (Heracleópolis Magna)*, vol. 2, IA/E2, Plate LIX, i.

[17] López Grande-Quesada Sanz, "La cerámica", 100, Type IIIC.3 HM89, H25/4. IIIb.

[18] Aston, *Elephantine XIX. Pottery from the Late New Kingdom to the Early Ptolemaic Period,* Plate 66, No. 1917.

[19] Aston, *Egyptian Pottery of the Late New Kingdom and Third Intermediate Period (Twelfth-Seventh Centuries BC). Tentative footsteps in a Forbidden Terrain*, 92.

[20] Aston, *Egyptian Pottery of the Late New Kingdom and Third Intermediate Period*, 92.

[21] Aston, *Elephantine,* 204, Plate 64, No. 1879.

[22] Aston, *Elephantine,* 216, Plate 66, No.1918 and 1919. Cfr. Spencer, *Tell el-Balamun 1991-1994*, 19, Plate 61, type A.3, 79.10; Brissaud, "Répertoire préliminaire de la poterie trouvée à San el-Hagar (1re Partie)", *CCE* 1

A large bowl in Nile $C_2$ (No. 25, Inv. No. C-0379 [055]) seems to be present also at a later period and is very similar to one exemplar from Tell el-Qedwa.[23] The rim slopes down to the interior of the bowl.[24] Similar to this there are some other samples as No. 26, Inv. No. C-1172 [005] that Aston ascribed to Phase V.[25]

Different kind of jars was found at Tell el-Ghaba. One of them (No. 27, Inv. No. P0164A) is similar to Type XXII.D from Heracleopolis Magna, whose rim diameter oscillates between 12.00-14.00 cm.[26] It is frequently found in contexts from the VIIth century BC.[27] Aston records other similar jars from the Intef cemetery at Thebes during the 25th and 26th Dynasties, sometimes white or red polished.[28] In Marl $A_4$, it is recorded as squat jar by Aston in Elephantine for Phase III[29] and Defernez at Karnak in Saite contexts.[30]

Globular jars in Nile clay are abundant at Tell el-Ghaba. According to Paice, the globular shape with a narrow vertical neck was suited to the containment of liquids in these vessels with the minimum risk of spilling. Some bases have been smoke-blackened in their use as cooking function. An alternative to a base support could be suspension in a net support or from a cord tied around the ribbed neck. This would suggest a function as carrier of water or other liquids.[31] Jars in Nile $B_2$ (No. 28, Inv. No. C-0376 [004] and No. 29, Inv. No. C-1104 (2) [002]) are eloquent exemplars of this kind of jars. Usually they have vertical or everted direct rims.

A globular jar made of Nile $B_2$ (No. 30, Inv. No. P0161A) is similar to those found at Tell el-Maskuta[32] It has ridges around the jar and tiny handles below them. According to Paice this type can be dated to VIth century BC occupation layers belonging to Saite contexts. These jars are usually covered with a red slip as is the case of the vessel from Tell el-Ghaba.

Another globular jar in Nile $B_2$ (No. 31, Inv. No. P0615A) can be paralleled to another one in Nile $C_1$ from Elephantine dated to Phase V, but it has a different rim.[33]

Slender jars in Nile clay are found also at the site. One of them (No. 32, Inv. No. P0223A) is made of Nile $B_1$ and has appeared in Saite contexts at Tell el-Maskhuta.[34] Defernez has detected a similar vessel in marl clay at Karnak without the rilling lines in the body[35] like Aston in Elephantine; it is made of Marl $A_4$ and has two handles.[36] These vessels were dated by Aston to Phase V. It can be also noted that some vessels from Tell el-Ghaba have their counterpart in marl clay as we mentioned above. Similar to Inv. No. P0223A is another jar (No. 33, Inv. No. P0614A), coincident with the Saite type illustrated by Defernez at Karnak mentioned above, but in Nile $C_1$. It corresponds to Type XXIIIL, HM89, H29/1,

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(1987), Plate VII, 46-49; French and Ghaly, "Pottery chiefly of the Late Dynastic Period at Saqqara", *CCE* 2 (1991), No. 72-74; French, "Late Dynastic and Ptolemaic Pottery in Lower Egypt", *CCE* 3 (1992), No. 27 and 28, ascribed to the Third Phase of Late Dynastic Period.

[23] Hamza, "Qedwa", *CCE* 5 (1997), Fig. 2, No.14.

[24] Paice, *BES* 8 (1986-1987), Fig. 4, No. 8-13. No. 8-10 come from Saite layers while No. 11-13 are Early Persian.

[25] Aston, *Elephantine,* 220, Plate 68, 1966.

[26] López Grande-Quesada Sanz, "La cerámica", 92, Plate XLVI, f-k.

[27] López Grande-Quesada Sanz, "La cerámica", 92.

[28] Aston, *Egyptian Pottery of the Late New Kingdom and Third Intermediate Period*, Fig. 138, No. 771-775 and Fig. 141, No. 773.

[29] Aston, *Elephantine,* 220, 206, Plate 64, No. 1884.

[30] Defernez, *BCE* XXII (2004), 37, Fig. 10.

[31] Paice, *BES* 8 (1986-1987), 100.

[32] Paice, *BES* 8 (1986-1987), Fig. 6, No. 1.

[33] Aston, *Elephantine*, Plate 77, No. 2121.

[34] Paice, *BES* 8 (1986-1987), 95 - 107.

[35] Defernez, *BCE* XXII (2004), 37, Fig. 7.

[36] Aston, *Elephantine*, Plate 72, No. 2041.

fabric Ia from Heracleopolis Magna.[37] The rim has two or three horizontal grooves that delimit the mouth.

In Nile $C_2$, No. 34, Inv. No. C-0014 [001] (Level V, Area I, L0001) is a common type of ovoid jar described as Type XXIII.O at Heracleopolis Magna dated to the VIIIth-VIIth centuries BC.[38] French dated this type to the First phase of the Late Dynastic Period, to the half of the VIIth century BC.[39]

There are several jars in marl clays. In Marl $A_4$ we selected No. 35, Inv. No. C-0521 [025], No. 36, Inv. No. P2019A and No. 37, Inv. No. P0218A, both from Area II, L1001. The last one has the same morphology and fabric than the "jarre à anses et à haut col renflé" defined by Defernez[40] and depicted by Aston as a tall storage jar with grooved rims dated between 750-600 BC.[41]

Nile clay storage jars are abundant especially in L1001 as is the case of No. 38, Inv. No. P7053A. It was no found any vessel similar to this. Ledge-rimmed storage jars are very common as No. 39, Inv. No. C-1115 [001] (Area II, Level III, L1001).

The storage jar No. 40, Inv. No. C-1115 [034] is similar to another illustrated by Hamza in alluvial clay from Saite contexts and to another found in Area VI, L1001, in Nile $B_2$ (No. 41, Inv. No. C-6000 [032] and No. 42, Inv No. C-6000 [034]).[42] A similar storage jar but without handles is depicted by Brissaud.[43]

A storage jar in Nile $B_2$ (No. 43, Inv. No. C-0521 [028]) corresponds to type VIA, HM86, H18/6 of Heracleopolis Magna from the VIIIth-VIIth centuries BC. It belongs to Aston's Group 17, Phase III.[44] Similar to this storage jar, No. 44, Inv. No. C-0521 [005] is coincident to Type VII.G from Heracleopolis Magna and even though its datation is problematic, it can be ascribed to the end of the VIIIth century BC.[45] Another storage jar (No. 45, Inv. No. C-0521 [013]) from L0001 has a parallel at Heracleopolis Magna dated to the VIIIth to the half of the VIIth century BC.[46]

There are several amphorae in Marl F that imitate imported amphorae (No. 46, Inv. No. C-0521 [138], No. 47, Inv. No. C-0521 [133], two of them torpedo type (No. 48, Inv. No. C-0521 [153] and No. 49, Inv. No. C-0521 [135]), all of them from L0001 and No. 50, Inv. No. C-6000 [053], from Area VI, L1001. Some bowls from L0001 are also made of Marl F (No. 51, Inv. No. C-0521 [157] and No. 52, Inv. No. C-0521 [050]).

Bakery trays in Nile clay are very abundant, especially from Area II, L1001. Some are hand-made, particularly the base that presents fingerprints as decoration. Bakery trays from L0001 are similar to those found in Area II (No. 53, Inv. No. P0632A, No. 54, Inv. No. P0585A and No. 55, Inv. No. P0631A).

In L0001 there were found also pilgrim flasks and a model pilgrim flask, made of Nile silt clay. One of them preserves the rim, neck, handles and shoulder (No. 56, Inv. No. P1173A) and another has three handles (No. 57, Inv. No. P0822A). At Heracleopolis Magna a

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[37] López Grande-Quesada Sanz, "La cerámica", Plate XLV a and b.

[38] López Grande-Quesada Sanz, "La cerámica", 88, Plate XLI, e.

[39] French, "Late Dynastic Period and Ptolemaic Pottery in Lower Egypt", *CCE* 3 (1992), No. 10. It has a parallel at Saft and Suwa in the Eastern Delta (F. Petrie, *Hyksos and Israelite Cities* (London, 1906), Plate XXXIXC, No. 26; Plate XXXIXD, No. 102, 104; Plate XXXIX E, No. 119, 120, 122, 123, 127).

[40] Defernez, *BCE* XXII (2004), 37, Fig. 12.

[41] Aston, *Elephantine*, 193, Plate 58, No. 1736-1743 and 195, Plate 59, No. 1759.

[42] Hamza, "Qedwa", *CCE* 5 (1997), Plate IX, 1.

[43] Brissaud, "Répertoire préliminaire de la poterie trouvée à Sân El-Hagar (2e partie)", in *Cahiers de Tanis I. Mission Française des Fouilles de Tanis, Mémoires N° 75.*

[44] Aston, *Egyptian Pottery of the Late New Kingdom and Third Intermediate*, *passim.*

[45] López Grande-Quesada Sanz, "La cerámica", Plate XLIVa, BD.III2a/53211, HM89, H29.M-592.

[46] López Grande-Quesada Sanz, "La cerámica", Plate XLVIII, i, BD.14b/51421b, HM88, H21/3, fabric Ia. The Spanish team ignores any vessel paralleled to that from Heracleopolis Magna.

similar pilgrim flask was found.[47] They are associated to finds from the end of the VIIIth century to the middle of the VIIth century BC.[48]

Other pilgrim flask (No. 58**,** Inv. No. P0059) is made of Nile $C_2$. According to studies carried out at Heracleopolis Magna[49] this type is coincident with Aston´s Group XVI dated to the Third Intermediate Period onwards.[50] It is lenticular in shape and it was made in two halves and then joined together.

The model pilgrim flask in Nile $B_2$ is red burnished (No. 59**,** Inv. No. P0623A). Lenticular in shape as that mentioned above it is found also at Heracleopolis Magna dated to the 25th and 26th Dynasty.[51] According to Aston it can be adscribed to Group XVI of Phase III since it is a characteristic shape from the Third Intermediate Period.[52] This shape has survived after this period since it is associated with Saite material at Tell el-Ghaba.

In L0001, from Area I, there is a lid in Nile $B_2$ (No. 60**,** Inv. No. C-0521 [029]) similar to another from Saite contexts at Tell el-Maskhuta.[53] A different kind of lid (No. 61**,** Inv. No. P0032A) than the rest found at Tell el-Ghaba, made also of Nile $B_2$, has straight vertical walls and its base was cut from the wheel with a string.[54] This type of lid was found in deposits of the VIth to Vth centuries BC at Tell el-Maskuta in Saite-Persian contexts,[55] and at Tell el-Balamun.[56]

The Egyptian pottery from L0001 and L1001 belongs to the so-called Phase IV North (c. 650/625-575/525 BC).[57]

## Conclusions

According to the studies carried out on the material from L0001 and L1001 we may conclude that:

- In spite of being L0001 and L1001 a destruction layer, the ceramic repertoire presents the most representatives types of vessels, several of them already observed in the strata below, but others are unique in the site.
- In Area I, Egyptian bowls, jars, juglets and storage jars are abundant, but the number of storage jars and bakery trays increase in Area II. Area VI presents the coarsest vessels.
- Major quantity of Egyptian fine ware is present in Area I, L0001 than in Areas II and VI, L1001.
- The Nile silt clay fabric mainly used for the local pottery is Nile $B_2$ for all the shapes (fine and household ware), except for the cooking pots (Nile $E_2$), some storage jars (Nile $C_1$ or Nile $C_2$), and some juglets in Nile $E_2$.
- There are imitations of foreign shapes in Marl F (bowls, juglets, amphorae) and in alluvial clays, especially from Palestine tradition.
- Some pottery in Nile clay is reproduced in marls clays.

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[47] López Grande-Quesada Sanz, "La cerámica", Type XXVC. HM86, L11.
[48] López Grande-Quesada Sanz, "La cerámica", 95.
[49] López Grande-Quesada Sanz, "La cerámica", 95, Plate LI, g, Type XXVE, HM85, H5/6.
[50] Aston, *Egyptian Pottery of the Late New Kingdom and Third Intermediate Period*, 74, Fig. 218, i.
[51] López Grande-Quesada Sanz, "La cerámica", 95.
[52] Aston, *Egyptian Pottery of the Late New Kingdom and Third Intermediate Period*, 74, Fig. 218, i.
[53] Paice, *BES* 8 (1986-1987), Fig. 8, No. 15-20.
[54] Aston, *Elephantine*, 219, Plate 66, No. 1953.
[55] Paice, *BES* 8 (1986-1987), 102.
[56] Spencer, *Tell el-Balamun 1991-1994*, Plate 70, type H.1.
[57] Aston, *Egyptian Pottery of the Late New Kingdom and Third Intermediate Period*, 92.

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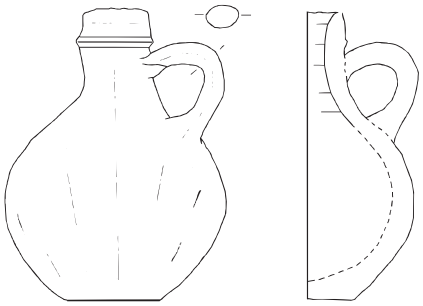

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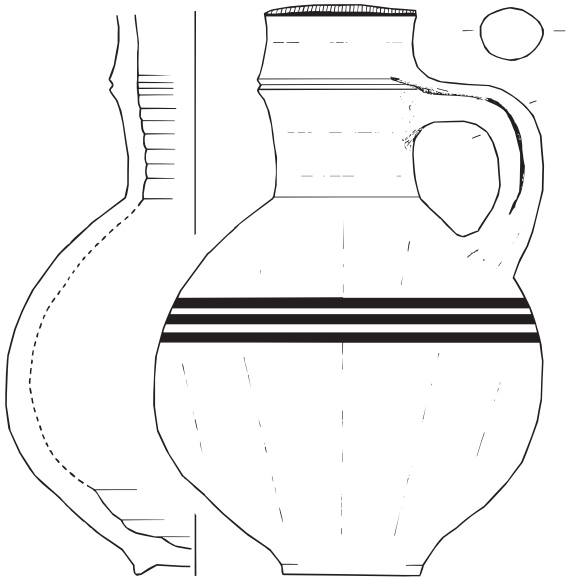

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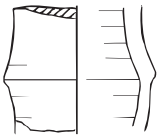

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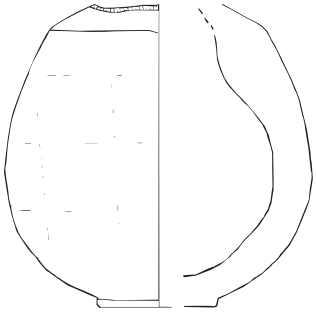

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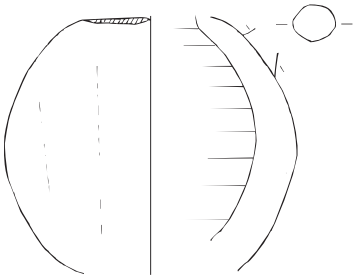

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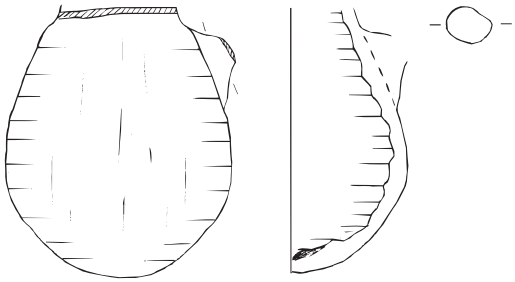

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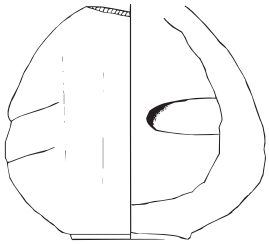

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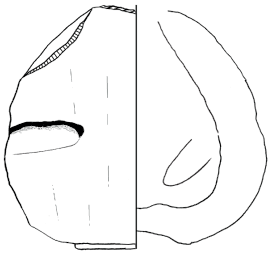

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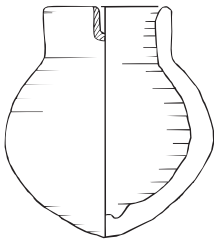

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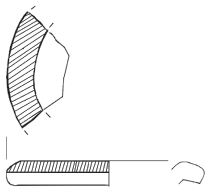

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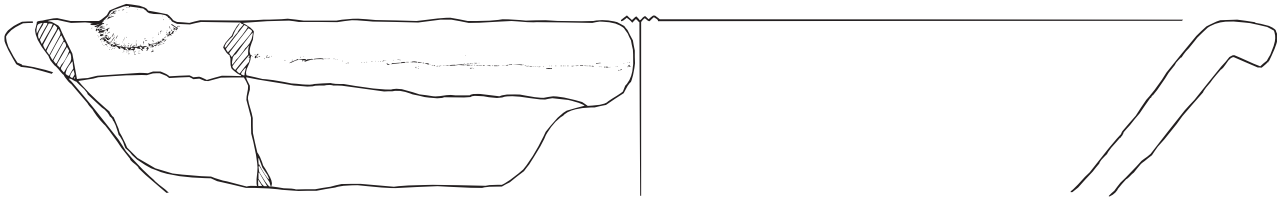

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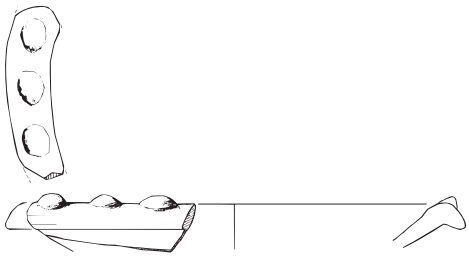

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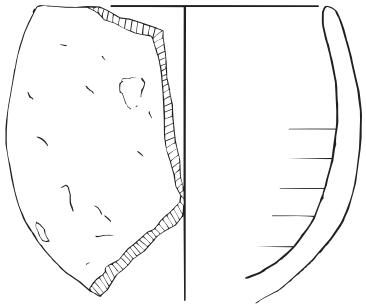

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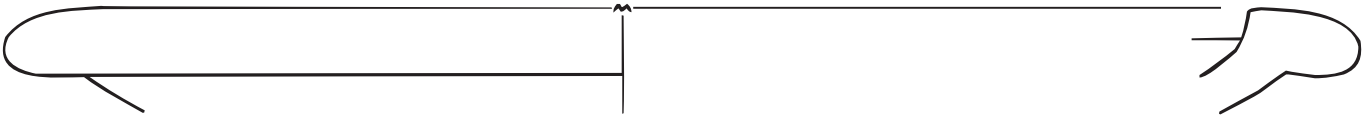

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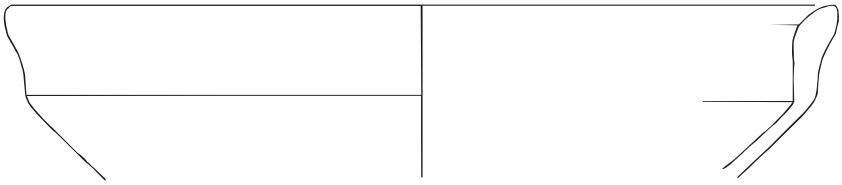

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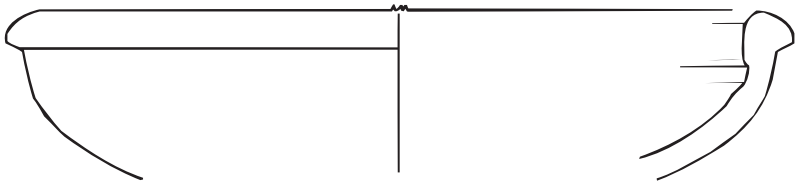

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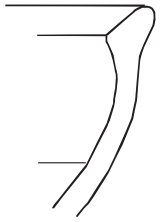

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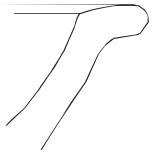

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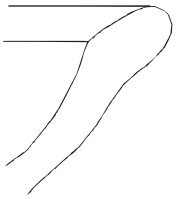

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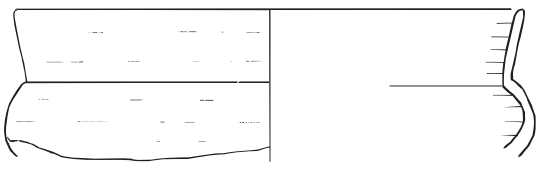

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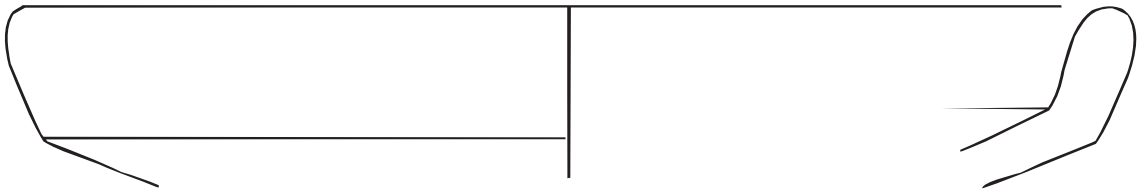

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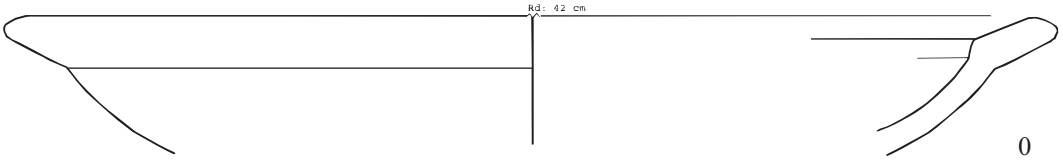


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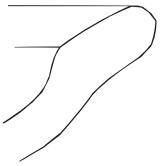

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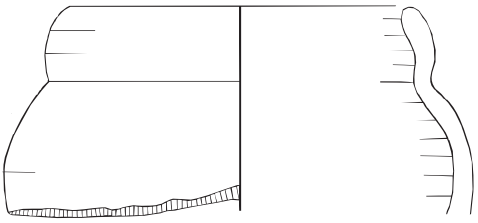

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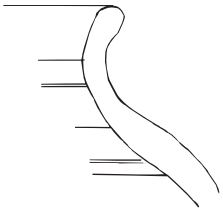

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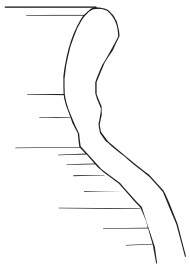

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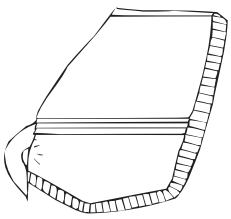



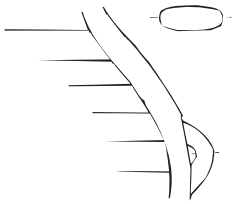

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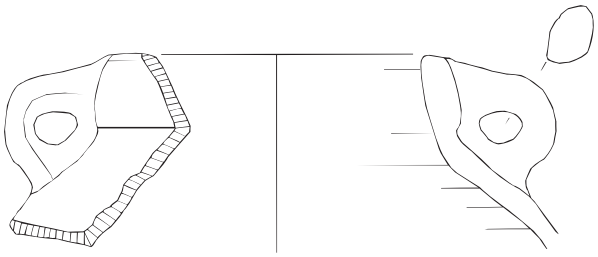

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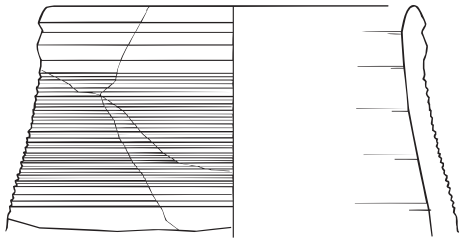

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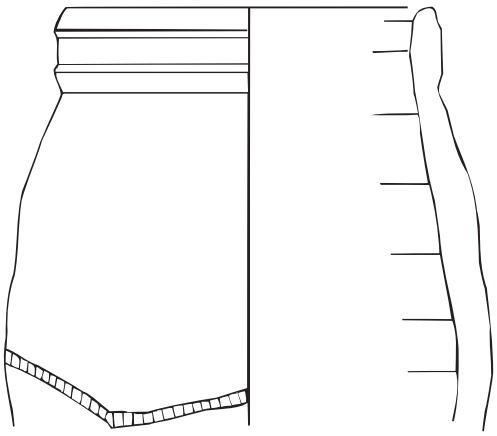

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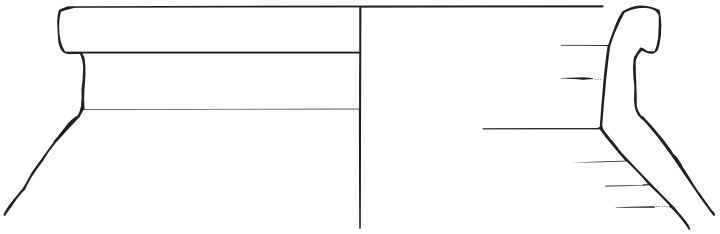

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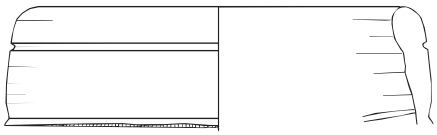
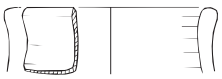
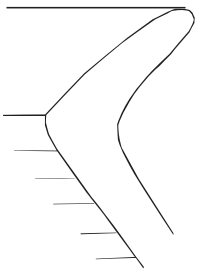


No. 37, Inv. No. P0218A
Area II, L1001

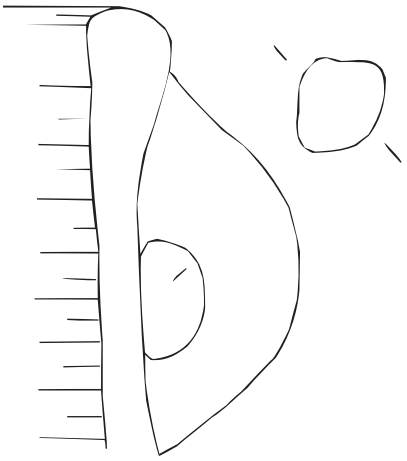
No. 35, Inv. No. C-0521 [025]
Area I, L0001
0 1cm



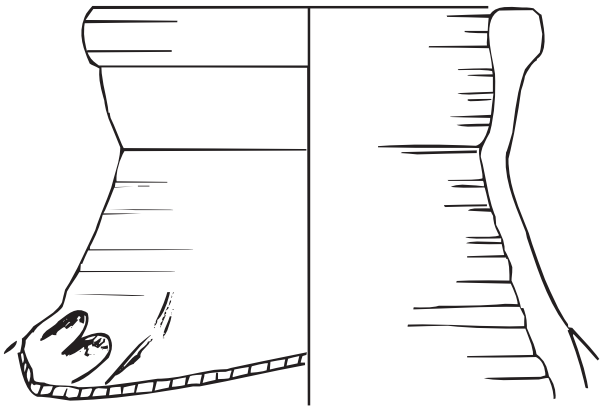
No. 36, Inv. No. P2019A
Area II, L1001



No. 39, Inv. No. C-1115 [001]
Area II, L1001

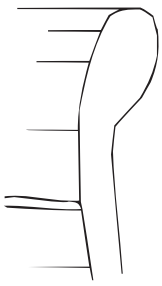


No. 40, Inv. No. C-1115 [034]
Area II, L1001

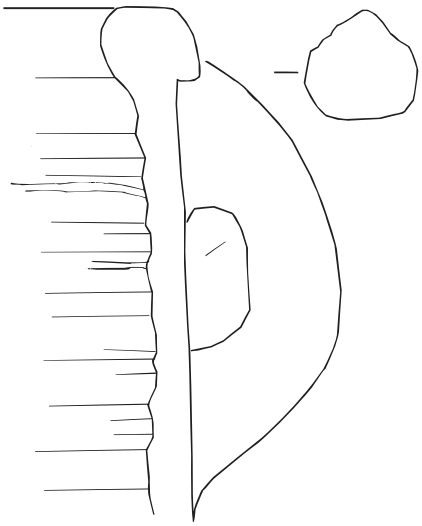


0 3cm

No. 38, Inv. No. P7053A
Area II, L1001

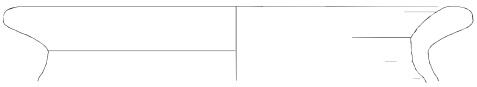


No. 42, Inv No. C-6000 [034]
Area VI, L1001

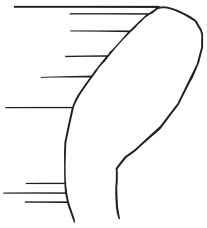


No. 41, Inv. No. C-6000 [032]
Area VI, L1001

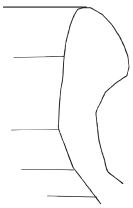
0 2cm



No. 43, Inv. No. C-0521 [028]
Area I, L0001

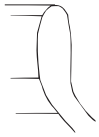


No. 44, Inv. No. C-0521 [005]
Area I, L0001



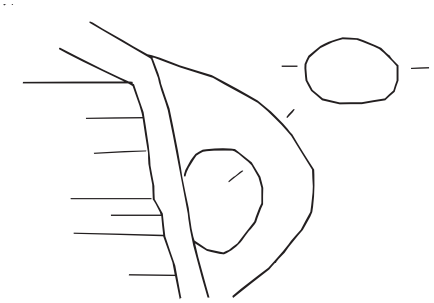
No. 45, Inv. No. C-0521 [013]
Area I, L0001

0 1cm



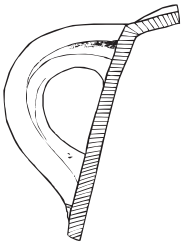
No. 46, Inv. No.C-0521 [138]
Area I, L0001

No. 47, Inv. No. C-0521 [133]
Area I, L0001

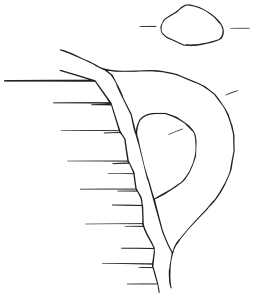


No. 48, Inv. No. C-0521 [153]
Area I, L0001

0 2cm

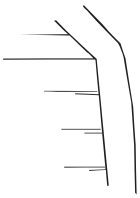




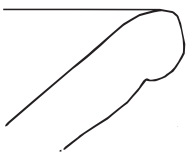


No. 49, Inv. No. C-0521 [135]
Area I, L0001

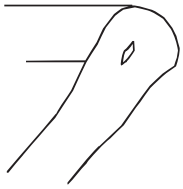
0 3cm



No. 50, Inv. No. C-6000 [053]
Area VI, L1001

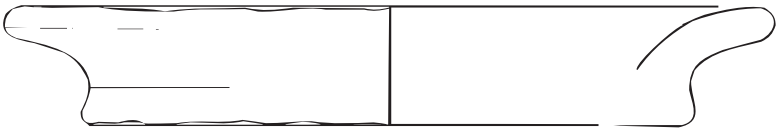


No. 51, Inv. No. C-0521 [157]
Area I, L0001

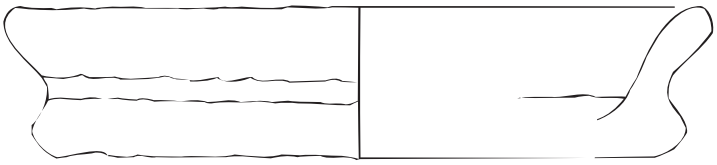


No. 52, Inv. No. C-0521 [050]
Area I, L0001

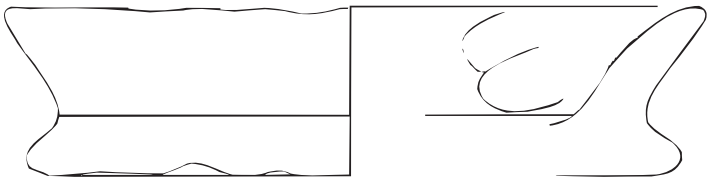
0 2cm



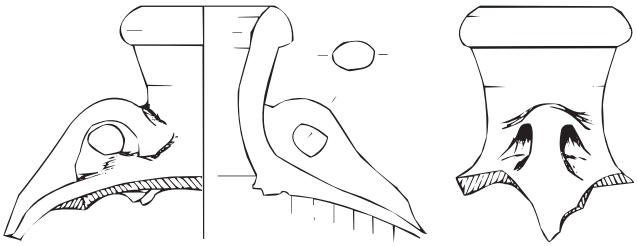
No. 53, Inv. No. P0632A, Area I, L0001



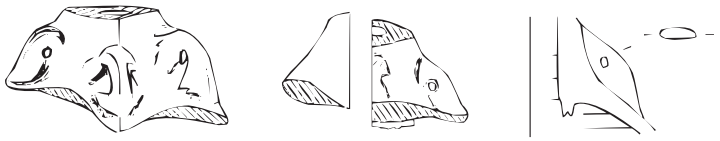
No. 54, Inv. No.P0585A, Area I, L0001



No. 55, Inv. No.P0631A, Area I, L0001



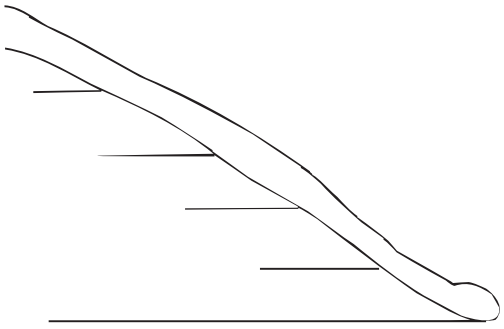
No. 56, Inv. No. P1173A, Area I, L0001



No. 57, Inv. No. P0822A, Area I, L0001

No. 58, Inv. No. P0059
Area I, L0001

No. 59, Inv. No. P0623A, Area I, L0001



No. 60, Inv. No. C-0521 [029], Area I, L0001

No. 61, Inv. No. P0032A, Area I, L0001

0 2cm

# II.- The imported pottery

**by Susana T. Basílico ****

## Levantine pottery

The imported pottery (from L0001 and L1001) found at Tell el-Ghaba is mostly from the Levant. It is represented by different shapes, among them *bowls*. There are the *mortaria,* a type of bowl very common in the region between the end of the VII century and the beginning of the VI century BC. No. 1, Inv. No. P1279A,[1] is a carinated *mortarium.* Similar vessels were found in the Saite fortress of Mezad Hashavyahu, in Judah,[2] imported from the Eastern Greek region. Some bowls from L0001 have the same shape but are made of local clays, as Egyptian imitations of imported ceramics. Similar mortaria in Nile clay were found in the Saite levels at Tell el-Balamun[3] and Tell El-Maskhuta.[4]

No. 2, Inv. No. P1044A, is a Phoenician[5] "White Painted" *bowl*, decorated outside and inside, such as the Cypriote WP and Black-on-Red wares.[6] No. 3, Inv. No. P0042A,[7] is a "Black-on-Red" *bowl* similar to those from Horbat Rosh Zayit.[8] No. 4, Inv. No. P1095A, is a sherd from a Phoenician "White Painted" bowl[9] with horizontal handle.

Different types of *amphorae*, were used in the Iron Age as containers for transporting olive oil, resins, honey and incense.[10] There are *basket-handled jars*, but of this type only the handle from a Levantine jar was preserved (No. 5, Inv. No. P0094B,[11] with a very pale brown slip). These large transport storage jars were used as containers only for maritime trade, and their contents were moved into smaller amphorae in the harbours for inland distribution.[12] Basket-handled jars of different origins are known at Mezad Hashavyahu[13] and Berytus.[14] Gjerstad[15] and Karageorghis[16] published basket-handled jars from different sites in Cyprus, with whitish or light brown slip, and some vessels from Marion, respectively. According to Karageorghis, this shape of containers was developed in eastern Cyprus during the Iron Age.

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** DEGIP-IMHICIHU-CONICET, Buenos Aires, Universidad de Buenos Aires and Universidad Católica Argentina. We thank Elsa Rosenvasser Feher for the careful readings of the manuscript.

[1] Fabric IV.? On the classification of the imported fabrics found at Tell el-Ghaba mentioned in this article, see Cremonte in this volume, 88-91.

[2] Fantalkin, *Tel Aviv* 28, 79-81 and Fig. 29.

[3] Spencer, *Excavations at Tell El-Balamun 1991-1994*, Plate 61: 3.

[4] Paice, *BES* 8, 100 and Fig. 4.

[5] IV.TG 38 (IV.Phoen.02).

[6] Gjerstad, *The Cypro-Geometric*, Fig. XXVIII: 1, 2, 3, 6; Fig. XXX: 4 - 5.

[7] IV? Fabric.

[8] Gal and Alexandre, *Horbat Rosh Zayit*, 73, Figs. III.77:16 and III.78:24.

[9] IV.TG 38 (IV.Phoen.02).

[10] Alpözen et al., *Commercial Amphoras*, 35-40.

[11] IV. TG 01.

[12] Fuscaldo, Lupo and Basílico, in *Proceedings of the 4th International Congress of Archaeology of the Ancient Near East.*

[13] Naveh, *IEJ* 12, 97 and Fig. 6:13.

[14] Badre, in *Proceedings of the International Symposium Eastern Mediterranean: Cyprus-Dodecanese – Crete 16th – 6th Century BC,* 83 and Fig. 9: 2.

[15] Gjerstad, *The Cypro-Geometric*, Fig. LVII: 5 and Fig. LXIII: 2, "Plain White V" and "Plain White VI" respectively.

[16] Karageorghis, *Ancient Cypriote Art in Copenhagen*, 46-47.

They also were found in Egypt, at Naucratis,[17] Qedwa,[18] Tell Defenneh[19] and other sites, besides local imitations and other containers imported from Phoenicia and the Eastern Mediterranean.[20]

The "*torpedo" amphora* is another type. Levantine torpedo type containers were numerous in L0001, such as groups of shoulder, body and base sherds from the same vessel (No. 6, Inv. No. P7045A[21]), shoulders with handle or only shoulders. The torpedo type amphorae from Tell el-Ghaba had flat or rounded shoulders and small vertical handles:[22] No. 7, Inv. No. 1289A,[23] No. 8, Inv. No. P1295A,[24] No. 9, Inv. No. P0075A,[25] No. 10, Inv. No. P0095A,[26] No. 11, Inv. No. P1069A,[27] No. 12, Inv. No. P1070A,[28] No. 13, Inv. No. P0115A,[29] and No. 14, Inv. No. C-521 [119].[30]

These torpedo amphorae are similar to the ones found in different sites in the Levant, such as those published by Amiran[31] from Hazor (Iron Age IIC), for the morphology, and the colour and composition of the fabrics. For Bikai,[32] this type of containers appeared ca. 760 BC, and most of the vessels found at Megiddo, Hazor and Ashdod belonged to the last part of the VII century BC. In Tel Miqne-Ekron, in a workshop for olive oil production, the torpedo type amphorae were found in contexts dated between 700 and 600 BC.[33] In Mezad Hashavyahu there were some flat-shoulder amphorae characteristic of the Levantine coast from the VIII century on[34], besides the rounded-shoulder type very common in the VII century BC; [35] similar shapes and fabric (most of them belonging to fabric group 1:1) were recovered in L0001 at Tell el-Ghaba.

In Egypt, Tell el-Maskhuta[36] provided a large collection of torpedo type amphorae. Paice described them as storage jars. "The earlier store jars" (those from the end of the VII century and the beginning of the VI century BC) "have long sloping shoulders and small handles. The body continues as a cylinder, of the same diameter as the shoulder, ending in a wide-angled base".[37] Similar vessels come from Qedwa, from the end of the VII century BC,[38] and from Buto.[39] The torpedo storage jars from Tell el-Ghaba belong to this earlier

[17] Petrie, *Naukratis I*, Plate XVII : 17, 20, 21.
[18] Oren, *BASOR* 256, 17, and Fig. 21: 5 and 11.
[19] Petrie and Griffith, *Tanis II*, 47.
[20] Munford, *International Relations*, 814-819.
[21] IV.TG 51.
[22] Basílico, *La cerámica importada de Tell el-Ghaba, norte de Sinaí. Interacciones locales y regionales durante la época saíta (Siglos VII-VI a.C.)*, 191ff. and Figs. 83-88.
[23] IV.TG 07.
[24] IV.TG 24.
[25] IV.TG 03.
[26] IV.TG 01.
[27] IV.TG 51.
[28] IV.TG 01.
[29] IV.TG 01.
[30] IV.TG 11.
[31] Amiran, *Ancient Pottery of the Holy Land*, 241-242 and Plate 81: 4, 5, 6, 7.
[32] Bikai, *BASOR* 229 (1978): 48-49, Fig. 1.
[33] Gitin, in Gitin and Dever (eds.), *Recent Excavations in Israel: Studies in Iron Age Archaeology,* 46 and Fig 2.12:4.
[34] Fantalkin, *Tel Aviv* 28, 63-64 and Fig. 25: 9, 10, 11, 12.
[35] Fantalkin, *Tel Aviv* 28, 66 and Fig 6.
[36] Holladay, *Cities of the Delta III*, Plate 8: 9, 10, 11.
[37] Paice, *BES* 8, 98-99 and Fig. 1: 1, 2, 3.
[38] Oren, *BASOR* 256, 17; Hamza, *CCE* 5, 81 and Figs. 9, 10, 11.

type. The Levantine *amphorae* sherds from Tell el-Ghaba (L0001) have a pointed bases (No.15, Inv. No. P0162A,[40] No. 16, Inv. No. C-0135 [019],[41] or round bases (No. 17, Inv. No. P0078A,[42] No. 18, Inv. No. C-0379 [49],[43] No. 19, Inv. No. C-0380 [102][44]); thick vertical direct rims and short necks (No. 20, Inv. No. P0381A,[45] No. 21, Inv. No. P7037A,[46] No. 22, Inv. No. C-0097 (2) [002],[47] No. 23, Inv. No. C-0379 [028],[48] No. 24, Inv. No. C-0512 [122][49], No. 25, Inv. No. C-0003 [010], this from Phoenicia[50]). Others have everted direct rims (No. 26, Inv. No. P1294A[51]), inverted direct (No. 27, Inv. No. C-0521 [116],[52] No. 28, Inv. No. C-0379 [003],[53] and No. 29, Inv. No. C-0521 [080],[54] from Phoenicia) or modeled rims (No. 30, Inv. No. C-0135 [004],[55] No. 31, Inv. No. C-0006 [019],[56] No. 32, Inv. No. C-0521 [114],[57] No. 33, Inv. No. C-0521 [102][58]), most of them collared. These rims are similar to those from the amphorae at Horbat Rosh Zayit,[59] Megiddo and Hazor.[60] At Tell El-Maskhuta there were similar rims from Phoenician amphorae.[61] A large number of handle fragments, mainly oval in section, was recovered at Tell el-Ghaba, such as No. 34, Inv. No. C-0006[005].[62]

Few Levantine storage jar sherds were found in L1001, but other shapes, such as jugs and juglets are quite abundant, probably because the functions of the buildings in Area II were different. Among the storage jars, were No. 35, Inv. No. P1053A,[63] No. 36, Inv. No. P1091A,[64] No. 37, Inv. No. P1088A,[65] No. 38, Inv. No. P2035A.[66]

The Levantine *jugs* are represented by neck fragments, one of them with the handle

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[39] Bourriau classified the torpedo amphorae from Buto in three categories. To the second category (IB) belong amphorae of Phoenician origin, with a morphology which was found in Egyptian contexts from the Third Intermediate Period to the Early Ptolemaic (*MDAIK* 59, 225-227).
[40] IV.TG 03.
[41] IV.TG 23.
[42] IV.TG 53.
[43] IV.TG 24.
[44] IV.TG 57.
[45] IV.TG 23.
[46] IV.TG 11.
[47] IV.TG 32.
[48] IV.TG 11.
[49] IV.TG 07.
[50] IV.TG 37.
[51] IV.TG 51.
[52] IV.TG 51.
[53] IV.TG 17.
[54] IV.TG 35.
[55] IV.TG 24.
[56] IV.TG 17.
[57] IV.TG 51.
[58] IV.TG 05.
[59] Gal and Alexandre, *Horbat Rosh Zayit*, 103, Fig. III. 83: 10-18.
[60] Amiran, *Ancient Pottery of the Holy Land*, Plate 79: 2, 4, 5; Plate 81: 4-7.
[61] Holladay, *Cities of the Delta III*, Plate 2: 8; Plate 4: 5-6; Plate 9: 1-2 .
[62] IV.TG 03.
[63] IV.TG 51.
[64] IV.TG 01.
[65] IV.TG 51.
[66] IV.TG 24.

attachment[67] and others collared, which is a characteristic of many of these vessels (No. 39, Inv. No. P1065A[68]; No. 43, Inv. No. P1063A[69]). This type of neck is found in the Akhziv jugs,[70] also in Tyre stratum III, dated by Bikai[71] in the second half of the VIII century BC, and in Cyprus. [72] Few handles from this type of jug were preserved at Tell el-Ghaba. These had medium size with round or oval section (No. 44, Inv. No. P2030A).[73]

Other jugs have decorated everted direct rims, such as No. 40, Inv. No. P0799A[74] and No. 41, Inv. No. P0518A,[75] both of them with red slip and a horizontal painted line on it. Another jug, with globular shape, has incised lines on the red polished slip (No. 42, Inv. No. P0839A[76]). The last two were made of Phoenician fabrics. Similar globular-shaped vessels with incised lines have conic necks with threefold rims and a large vertical handle from the rim to the shoulder, dated by Amiran in the Iron Age IIC. [77] In Cyprus, this shape is found in "Red Slip" ware.[78]

Some bases, necks and handles from *juglets* were recovered. A flat base (No. 45, Inv. No. P1052A)[79] with pinkish white polished slip, and ring base (No. 45bis, Inv. No. C-0001 (2) [001]);[80] two necks (No. 47, Inv. No. P2025A[81]) and three handles, oval in section (such as No. 46, Inv. No. P0777A[82]).

There were a few vessels with special functions, such as votive amphorae, whose bases were the only part preserved (No. 48, Inv. No. P0525A,[83] with smoothed surface treatment, and No. 49, Inv. No. P7020A,[84] with brownish red polished slip).

## Cypriote pottery

The repertoire imported from Cyprus is represented by bowls, jars, jugs, juglets, pilgrim flasks and amphorae, all of them sherds; the main decorated wares are "White Slip" and Black-on-Red".

Three fragmentary *bowls* belong to the "White Painted ware". No. 50, Inv. No. P0517A, is decorated on both surfaces; No. 51, Inv. No. P1040A,[85] is an everted direct rim with painted lines on it; No. 52, Inv. No. P0208A,[86] with slightly everted rim is "White

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[67] Inv. No. C-0521 [148].
[68] IV.TG 01. On this type see Amiran, *Ancient Pottery of the Holy Land*, Plate 86: 4 and 6.
[69] IV.TG 24.
[70] Dayagi-Mendels, *IAA,* Report Nº 15, 126 and Fig. 5.10: 1-5. P1063A is similar to the Akhziv jug published in Fig. 5.9: 2.
[71] Bikai, *BASOR* 229, 51 and Fig 3: 2-5.
[72] Bikai, *The Phoenician Pottery of Cyprus*, Plate XI: 190, 195, 196 and 202.
[73] IV.TG 51.
[74] IV.TG 07.
[75] IV.TG 38.
[76] IV.TG 35.
[77] Amiran, *Ancient Pottery of the Holy Land*, 272 and Plate 92: 4-8.
[78] Gjerstad, *The Cypro-Geometric*, Fig. XXVII: 1, 2, 4.
[79] IV.TG 03.
[80] IV.TG 13.
[81] TD IV.21.
[82] IV.TG 51.
[83] IV.TG 11.
[84] IV.TG 51.
[85] VI.TG 04.
[86] VI.TG 04.

Painted II".[87] Also some "White Painted" body sherds from *jars* were found, such as No. 55, Inv. No. P1176A[88] and No. 56, Inv. No. P1031A.[89]

There were a flat everted rim (No. 57, Inv. No. P0842A[90]), and a neck and the handle attachment (No. 58, Inv. No. C-0521[147][91]) from two *jugs,* and two everted rims from *juglets* (No. 59, Inv. No. P0015A[92] and No. 60, Inv. No. P7098A[93]).

No. 61, Inv. No. P0367A,[94] is a "Black-on-Red" juglet with concentric circles and horizontal lines on the body.[95] A similar vessel was found at Hebwa II.[96] This style appeared also in different parts of the Levant, such as at Akhziv, and in the Aegean. "Black-on-Red II" is characteristics of the middle of the VIII century to the VII century BC, [97] but at the same time "Black-on-Red III" appears and "Black-on-Red I" is still in use.

From the *pilgrim flasks*, there are only a round section painted handle (No. 62, Inv. No. P1221A[98]) and the neck and upper part of the vertical handles, oval in section (No. 63, Inv. No. P7008A[99]).

The other body sherds are very fragmentary, and some of them belonged to juglets with no diagnostic decoration.[100]

There were also amphorae with vertical articulated exterior rims and modelled lips, such as No. 53 (Inv. No. C-0521[087]) and No. 54 (Inv. No. C-0521 [088]).[101]

## Aegean pottery

The high technologic repertoire of this ceramic included sherds from bowls, jars, jugs, juglets and amphorae, in different wares. Among the *bowls,* there are No. 64, Inv. No. P0712A, in a combined style, "Bichrome" outside and "White Painted" inside; No. 65, Inv. No. P7104A and a body sherd from a "Black-on-Red"? ware, painted on a polished surface,[102] and No. 66, Inv. No. P1066A,[103] a "Plain White" bowl with everted direct rim. From *jars,* ring bases, No. 67, Inv. No. P0201A,[104] No. 68, Inv. No. P0745A,[105] and the shoulder of a torpedo type amphora, No. 69, Inv. No. C-0521[121][106] are preserved.

A *fine amphora* sherd in "White Painted" ware, Oren Type A,[107] is from Quios (No. 70, Inv. No. P0048A),[108] Similar amphorae were recovered at Qedwa[109] and at Buto.[110]

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[87] Gjerstad, *The Cypro-Geometric*, Fig. XII: 6, 8, 9a. In Megiddo, stratum V, a similar bowl was found (Finkelstein, Zimhoni and Kafri, in Finkelstein, Ussishkin and Halpern (eds.), *Megiddo III,* 275, Fig. 11.23: 4).
[88] VI.TG 04.
[89] VI.TG 04.
[90] VI.TG 40.
[91] VI.TG 04.
[92] VI.TG 40.
[93] VI.TG 04.
[94] VI.TG 42.
[95] Gjerstad, *The Cypro-Geometric*, Fig. XXXVIII: 15, 6.
[96] Valbelle et al, *CRIPEL* 14: 19; Fig. 1.
[97] Dayagi-Mendels, 'The Akhziv Cemeteries' *IAA,* Report Nº 15, 138 and Fig. 5.14: 3, Type CP6.
[98] VI.TG 40.
[99] VI.TG 43.
[100] Inv. No. P0220A (VI.TG 04), Inv. No. P0807A (VI.TG 04), Inv. No. P0375A (VI.TG 04), Inv. No. P0226A (VI.TG 04) and Inv. No. P0228A (VI.TG 04).
[101] Both in VI.TG 40.
[102] VII.TG 48, from Samos.
[103] VII.TG 39.
[104] VII.TG 39.
[105] VII.TG 48 (Samian).
[106] VII.TG 48 (Samian).

Two globular-shaped *jugs* (No. 71, Inv. No. P0691A and No. 72, Inv. No. P0692A,[111] both with the rim broken), with ring bases, long necks, a round section handle and a red polished slip, belong to the *Akhziv type*,[112] with mushroom-shaped lip, widespread in the Eastern Mediterranean during the Iron Age III,[113] according to the classification made by Bikai.[114] For Dayagi-Mendels, who also classified the Akhziv vessels, this pottery was found in Punic sites from the VII century BC onwards. [115] In Tyre, they were very common from stratum III on, in the second half of the VIII century BC; [116] in other parts of the Levant and in Egypt they were dated to the end of that century onwards.[117] On the Cypriote pottery from Amathus, see Bikai.[118] These *Akhziv type* vessels found at Tell el-Ghaba have Aegean fabrics. They could reach Egypt directly from trade centres in the Aegean or through Levantine sites.

There were other "Black-on-Red" jug fragments: an everted direct rim (No. 73, Inv No. P1041A,[119] and body fragments, one of them from a barrel-shaped jug (No. 74, Inv No. P1093A).[120] The same style is found on *juglets,* such as No. 87, Inv. No. P0362B,[121] with compound neck, everted direct rim and vertical handle.[122] This is quite similar to that mentioned above from Akhziv.[123] The others are sherds: everted rims (No. 77, Inv. No. P1097A; No. 78, Inv. No. P0376A, No. 79, Inv. No. P0377A, No. 80, Inv. No. P0368A[124] and No. 81, Inv. No. P2005A[125]), necks (No. 82, Inv. No. P0210A, No. 83, Inv. No. P1185A, No. 84, Inv. No. P1179A, No. 85, Inv. No. P0211A,[126] and No. 86, Inv. No. P1046A[127]), body sherds and handles with oval section (No. 75, Inv. No. P0844A[128] and No. 76, Inv. No. P0216A.[129]

## Conclusions

The imported pottery from this destruction layer was found in contexts with large amounts of Egyptian ceramics – made of Nile clay and Egyptian marls, zoomorphic and anthropomorphic terracotta figurines, Bastet, Bes and baboons fayence figurines, scarabs, wdjat eyes, metal and alabaster objects, fayence and clay pieces of game, beads of different

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[107] Oren, *BASOR* 256, 24 and Fig. 22: 1-4.
[108] VII.TG 46, from Quios.
[109] Hamza, *CCE* 5, 85 and Fig. 14: 1-2.
[110] Bourriau, *MDAIK* 59, 228-229.
[111] Both jugs are made of VII.TG 46.
[112] Dayagi-Mendels, *IAA,* Report Nº 15, 126.
[113] On the pottery from the cemeteries at Akhziv: Amiran, *Ancient Pottery of the Holy Land*, 272-273 and Plate 92: 10-12.
[114] Bikai, *BASOR* 229, 49.
[115] Dayagi-Mendels, *IAA,* Report Nº 15, 126-127, Type JG5.
[116] Dayagi-Mendels, *IAA,* Report Nº 15, 126; Bikai, *BASOR 229,* 54-55.
[117] Bikai, *BASOR* 229, 49.
[118] *The Phoenician Pottery of Cyprus*, 68-69 and Plate XIII: 274, 278, 285.
[119] VII.TG 39.
[120] VII.TG 39.
[121] VII.TG 45.
[122] Gjerstad, *The Cypro-Geometric*, Fig. XXVIII: 3a and 3b, Fig. XXXVIII: 3a and 3b.
[123] Dayagi-Mendels, *IAA,* Report Nº 15, 138 and Fig. 5.14: 3.
[124] All these rims are made of VII.TG 39.
[125] VII.TG 45.
[126] All of them made of VII. TG 39.
[127] VII.TG 45.
[128] VII.TG 45.
[129] VII.TG 39.

materials, lead net-fishing weights, fishhooks, pumice sharpeners, mortars and fayence and metal slag.

The recovered imported ceramics shows the trade relations of Tell el-Ghaba with the Levant, Cyprus and the Aegean, probably through an important Egyptian centre in the area, Tell Defenneh or Qedwa, which were the most important fortified sites in the Eastern Delta during the Saite period.

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# List of Figures

| **No.** | **Inventory No.** | No. of order in **Tell el-Ghaba I** | Vessel |
|---|---|---|---|
| 001 | Inv. No. P1279A | L0001, Fig. 40, No. 234 | mortarium |
| 002 | Inv. No. P1044A | L1001, Fig. 58, No. 93 | bowl |
| 003 | Inv. No. P0042A | L1001, Fig. 58, No. 80 | bowl |
| 004 | Inv. No. P1095A | L1001, Fig. 58, No. 76 | bowl |
| 005 | Inv. No. P0094B | L0001, Fig. 40, No. 253 | amphora |
| 006 | Inv. No. P7045A | L0001, Fig. 40, No. 336 | amphora |
| 007 | Inv. No. P1289A | L0001, Fig. 40, No. 278 | amphora |
| 008 | Inv. No. P1295A | L0001, Fig. 40, No. 312 | amphora |
| 010 | Inv. No. P0095B | L0001, Fig. 40, No. 288 | amphora |
| 011 | Inv. No. P1069A | L0001, Fig. 40, No. 259 | amphora |
| 012 | Inv. No. P1070A | L0001, Fig. 40, No. 250 | amphora |
| 013 | Inv. No. P0115A | L0001, Fig. 40, No. 254 | amphora |
| 014 | Inv. No. C-521 [119] | L0001, Fig. 40, No. 289 | amphora |
| 015 | Inv. No. P0162A | L0001, Fig. 40, No. 265 | amphora |
| 017 | Inv. No. P0078A | L0001, Fig. 40, No. 352 | amphora |
| 020 | Inv. No. P0381A | L0001, Fig. 40, No. 303 | amphora |
| 021 | Inv. No. P7037A | L0001, Fig. 40, No. 282 | amphora |
| 022 | Inv. No. C-0097 (2) [002] | L0001, Fig. 40, No. 326 | amphora |
| 024 | Inv. No. C-0512 [122] | L0001, Fig. 40, No. 274 | amphora |
| 025 | Inv. No. C-0003 [010] | L0001, Fig. 40, No. 365 | amphora |
| 026 | Inv. No. P1294A | L0001, Fig. 40, No. 333 | amphora |
| 027 | Inv. No. C-0521 [116] | L0001, Fig. 40, No. 334 | amphora |
| 028 | Inv. No. C-0379 [003] | --- | jar? |
| 029 | Inv. No. C-0521 [080] | L0001, Fig. 40 No. 364 | amphora |
| 030 | Inv. No. C-0135 [004] | L0001, Fig. 40 No. 310 | amphora |
| 031 | Inv. No. C-0006 [019] | L0001, Fig. 40 No. 296 | amphora |
| 032 | Inv. No. C-0521 [114] | L0001, Fig. 40 No. 335 | amphora |
| 033 | Inv. No. C-0521 [102] | L0001, Fig. 40 No. 267 | amphora |
| 035 | Inv. No. P1053A | L1001, Fig. 58, No. 78 | jar |
| 036 | Inv. No. P1091A | L1001, Fig. 58, No. 85 | amphora |
| 037 | Inv. No. P1088A | L1001, Fig. 58, No. 92 | amphora |
| 038 | Inv. No. P2035A | L1001, Fig. 58, No. 90 | amphora |
| 039 | Inv. No. P1065A | L0001, Fig. 40, No. 246 | jug |
| 040 | Inv. No. P0799A | L0001, Fig. 40, No. 240 | jug |
| 041 | Inv. No. P0518A | L0001, Fig. 40, No. 245 | jug |
| 042 | Inv. No. P0839A | L0001, Fig. 40, No. 243 | juglet |
| 043 | Inv. No. P1063A | L1001, Fig. 58, No. 83 | juglet |
| 045 | Inv. No. P1052A | L1001, Fig. 58, No. 237 | juglet |
| 046 | Inv. No. P0777A | L0001, Fig. 40, No. 238 | juglet |
| 047 | Inv. No. P2025A | L1001, Fig. 58 ,No. 82 | juglet |
| 048 | Inv. No. P0525A | L0001, Fig. 40, No. 370 | votive amphora |
| 049 | Inv. No. P7020A | L0001, Fig. 40, No. 369 | votive amphora |
| 050 | Inv. No. P0517A | L0001, Fig. 40, No. 371 | bowl |
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| 052 | Inv. No. P0208A | L1001, Fig. 58, No. 98 | bowl |
| 053 | Inv. No. C-0521[087] | L0001, Fig. 40, No. 385 | amphora |
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| 057 | Inv. No. P0842A | L0001, Fig. 40, No. 380 | jug |
| 060 | Inv. No. P7098A | L1001, Fig. 58, No. 108 | juglet |
| 061 | Inv. No. P0367A | L1001, Fig. 58, No. 103 | juglet |
| 062 | Inv. No. P1221A | L1001, Fig 58, No. 95 | juglet |
| 063 | Inv. No. P7008A | L1001, Fig. 58, No. 110 | pilgrim? |

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|---|---|---|---|
| 064 | Inv. No. P0712A | L0001, Fig. 40, No. 392 | bowl |
| 065 | Inv. No. P7104A | L1001, Fig. 58, No. 112 | bowl |
| 066 | Inv. No. P1066A | L1001, Fig. 58, No. 141 | bowl |
| 068 | Inv. No. P0745A | L1001, Fig. 58, No. 113 | jar |
| 069 | Inv. No. C-0521[121] | L0001, Fig. 40, No. 414 | amphora |
| 070 | Inv. No. P0048A | L0001, Fig. 40, No. 413 | amphora |
| 071 | Inv. No. P0691A | L0001, Fig. 40, No. 403 | jug |
| 072 | Inv. No. P0692A | L0001, Fig. 40, No. 402 | jug |
| 073 | Inv. No. P1041A | L1001, Fig. 58, No. 122 | juglet |
| 074 | Inv. No. P1093A | L1001, Fig. 58, No. 124 | jug |
| 075 | Inv. No. P0844A | L0001, Fig. 40, No. 399 | juglet |
| 076 | Inv. No. P0216A | L1001, Fig. 58, No. 125 | juglet |
| 077 | Inv. No. P1097A | L1001, Fig. 58, No. 119 | juglet |
| 078 | Inv. No. P0376A | L1001, Fig. 58, No. 115 | juglet |
| 079 | Inv. No. P0377A | L1001, Fig. 58, No. 116 | juglet |
| 080 | Inv. No. P0368A | L1001, Fig. 49, No. 114 | juglet |
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| 083 | Inv. No. P1185A | L1001, Fig. 58, No. 132 | juglet |
| 084 | Inv. No. P1179A | L1001, Fig. 58, No. 120 | juglet |
| 085 | Inv. No. P0211A | L1001, Fig. 58, No. 139 | juglet |
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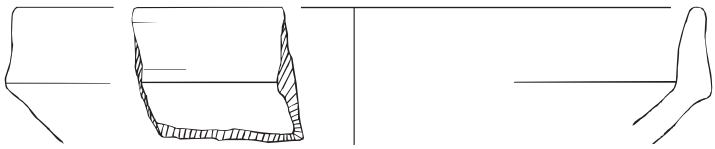

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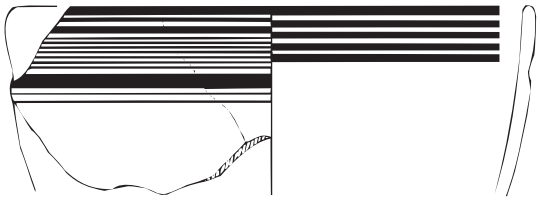

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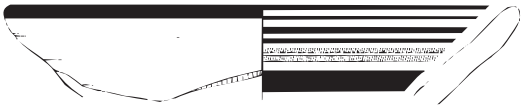

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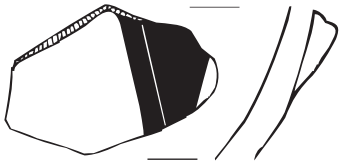

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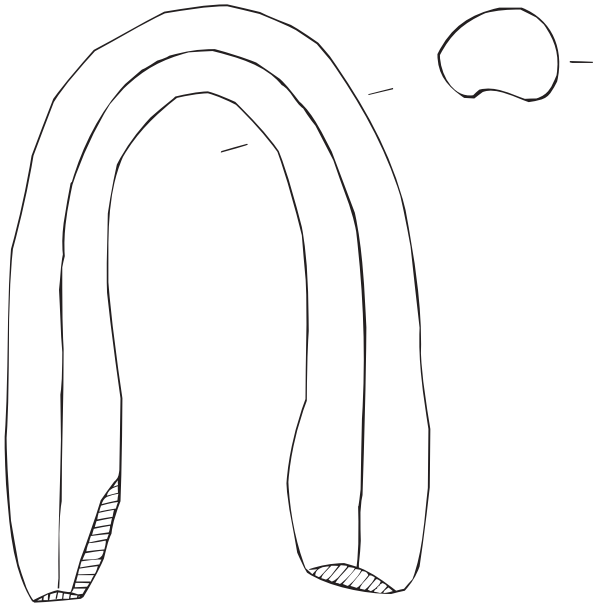

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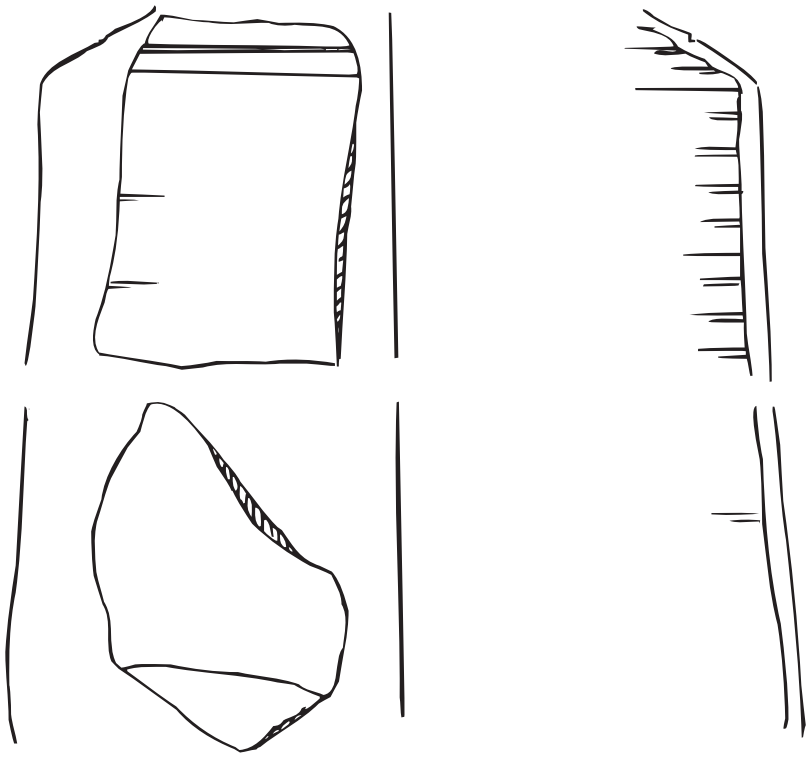

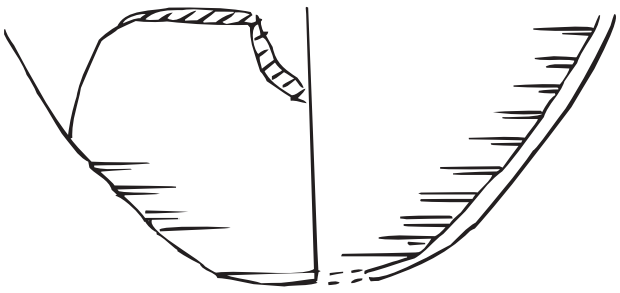

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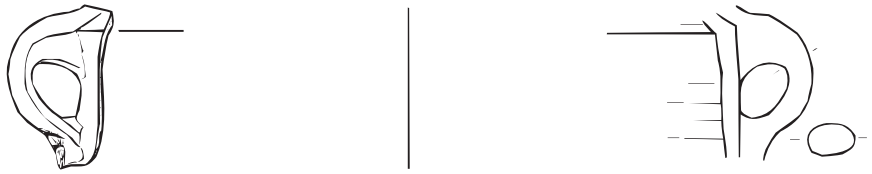

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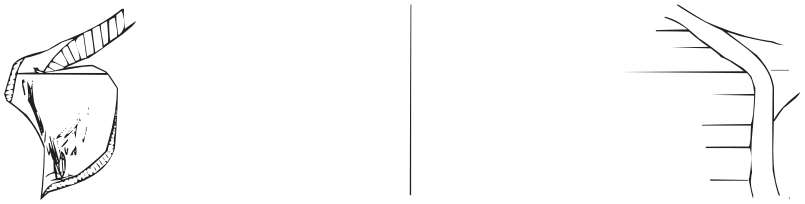

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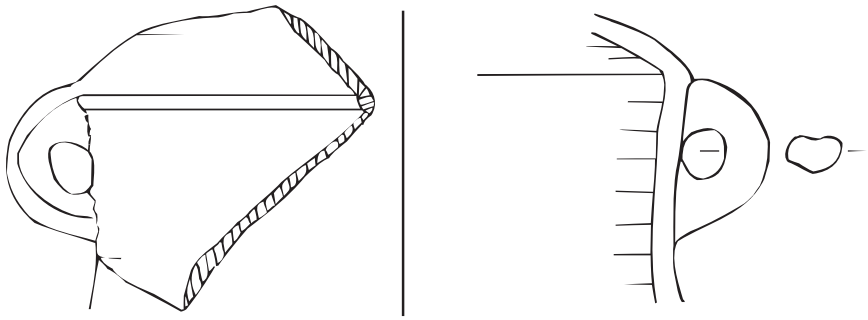

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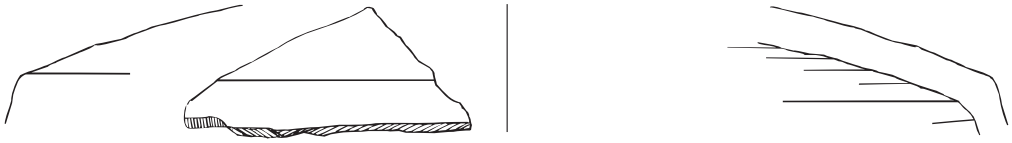

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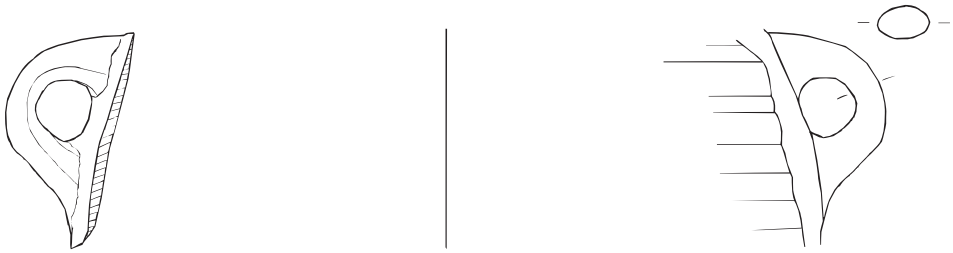

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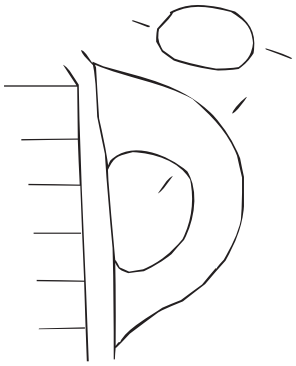
0 3cm



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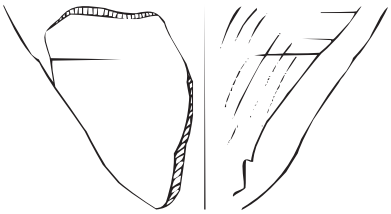

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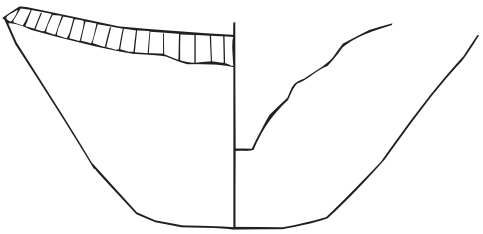
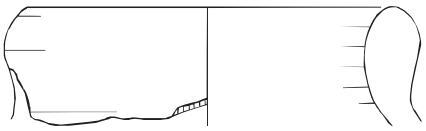


No. 017 Inv. No. P0078A, L0001



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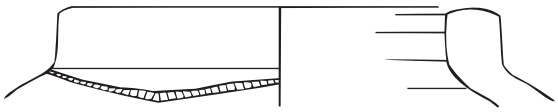

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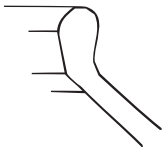

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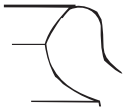

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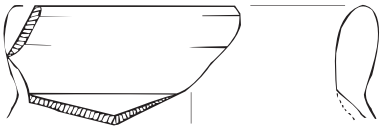
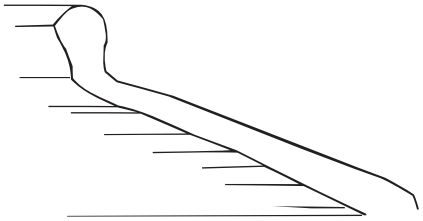


No. 026 Inv. No. P1294A, L0001

0 2cm

No. 027 Inv. No. C0521 [116]
L0001



No. 029 Inv. No. C0521 [080]
L0001

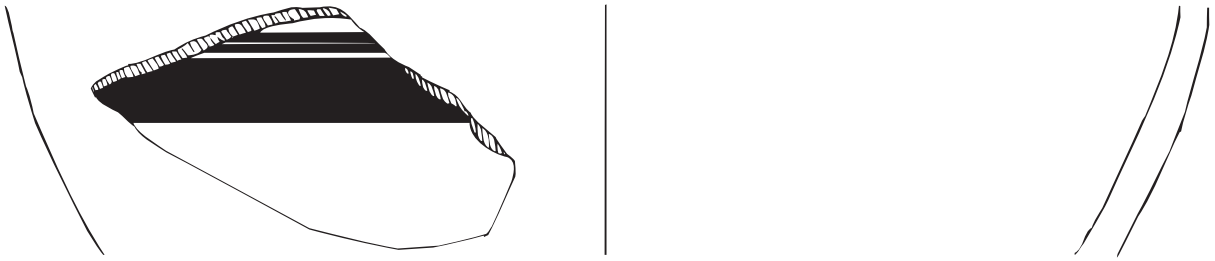
No. 030 Inv. No. C-0135 [004]
L0001

No. 031 Inv. No. C-0006 [019]
L0001

No. 032 Inv. No. C-0521 [114]
L0001

No. 033 Inv. No. C-0521 [102]
L0001

0 2cm



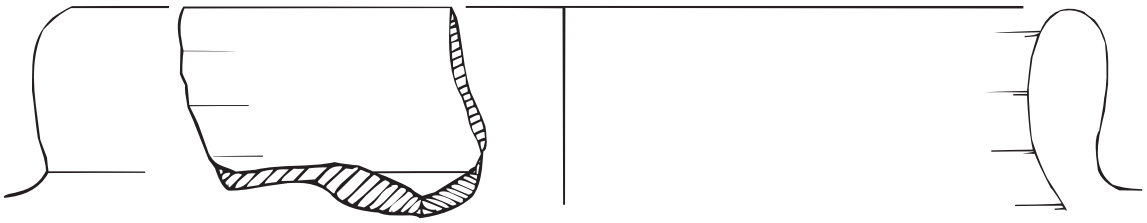
No. 035 Inv. No. P1053A, L1001

0 1cm

No. 036 Inv. No. P1091A, L1001

No. 037 Inv. No. P1088A, L1001

0 2cm



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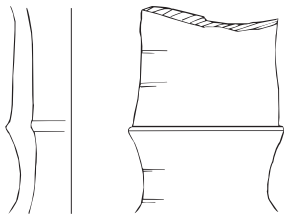
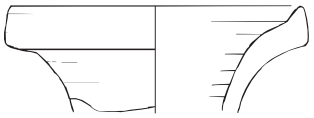
0 1cm



No. 039 Inv. No. P1065A
L0001



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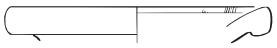
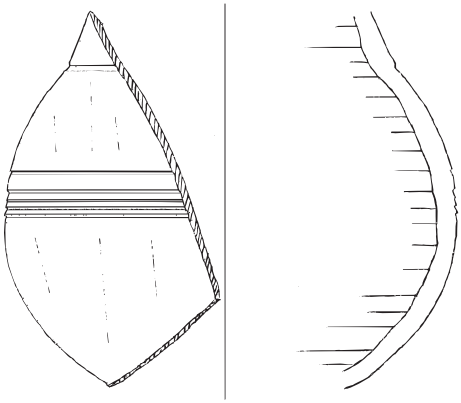
L0001



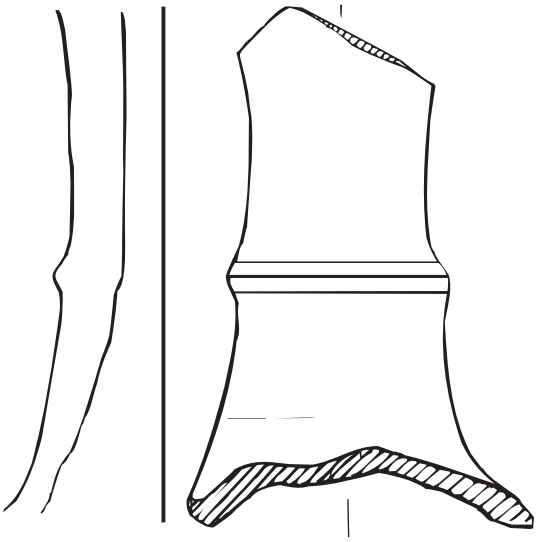
No. 041 Inv. No. P0518A
L0001

0 2cm



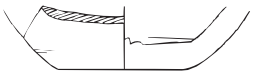
No. 042 Inv. No. P0839A
L0001

0 2cm



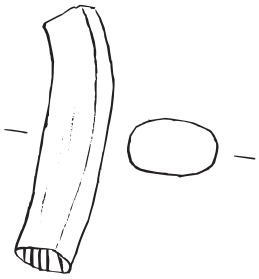
No. 043 Inv. No. P1063A
L1001

0 1cm



No. 045 Inv. No. P1052A
L0001

0 2cm



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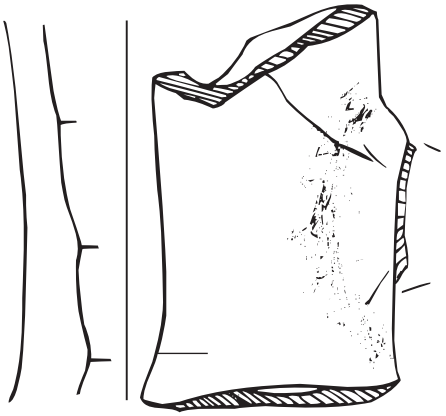
L0001



No. 047 Inv. No. P2025A
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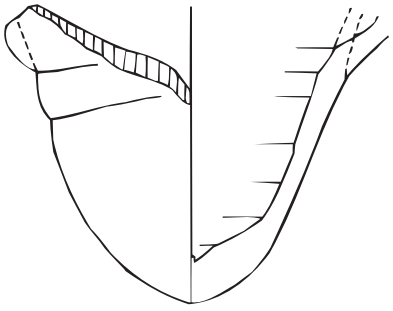
0 1cm



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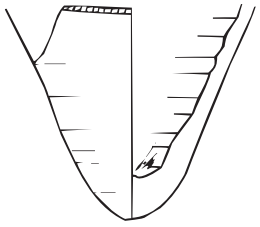
L0001



No. 049 Inv. No. P7020A
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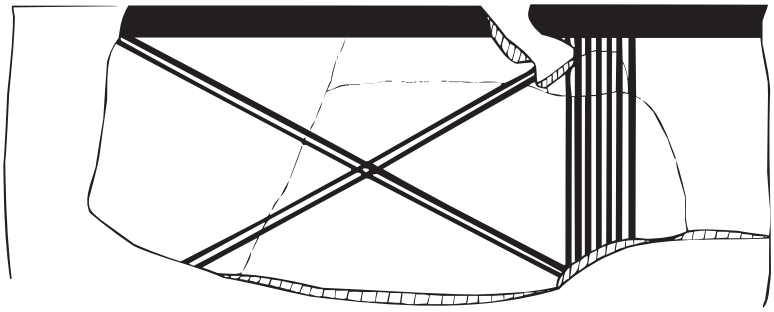
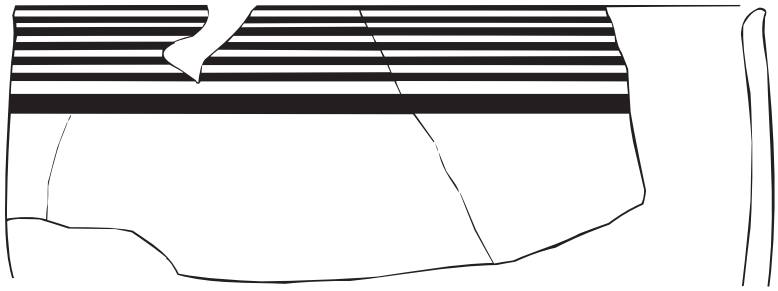
No. 050 Inv. No. P0517A, L0001

No. 051 Inv. No. P1040A, L1001





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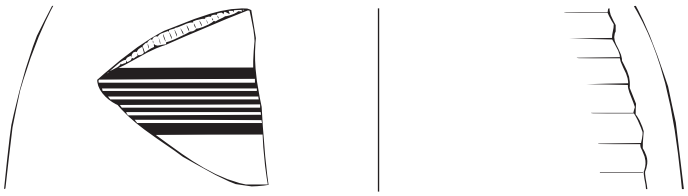
No. 053 Inv. No. C-0521 [087]
L0001



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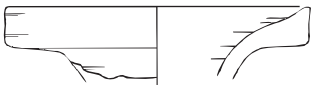
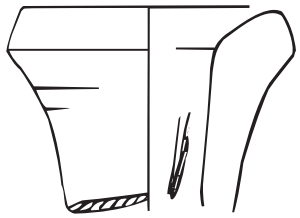


No. 057 Inv. No. P0842A, L0001

No. 056 Inv. No. P1031A, L0001

0 2cm



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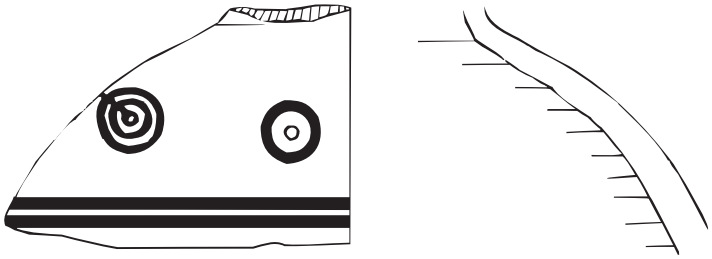
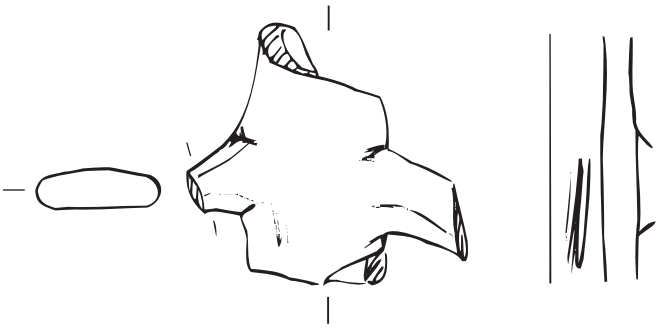


No. 061 Inv. No. P0367A, L1001

No. 062 Inv. No. P1221A
L1001

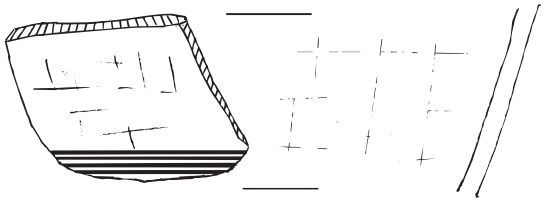


No. 063 Inv. No. P7008A, L1001

0 1cm

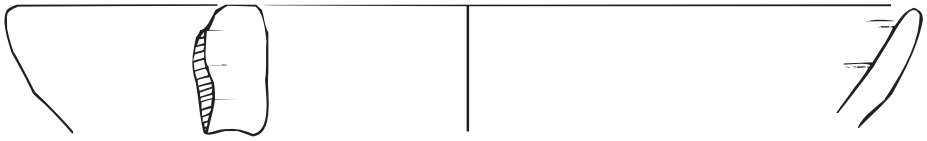
No. 064 Inv. No. P0712A, L0001

0 2cm



No. 065 Inv. No. P7104A, L1001

0 1cm

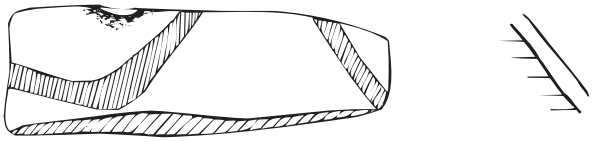


No. 066 Inv. No. P1066A, L1001

No. 068 Inv. No. P0745A, L1001

0 1cm

No. 069 Inv. No. C-0521 [121]
L1001



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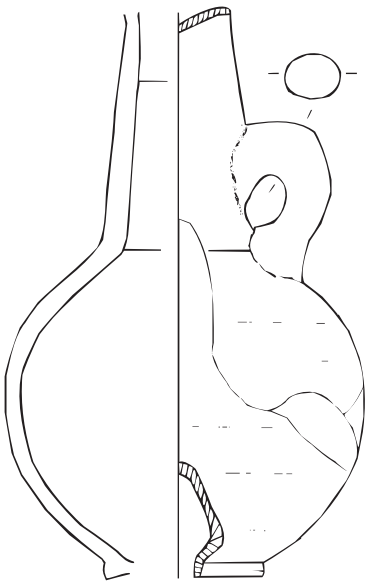
0 2cm



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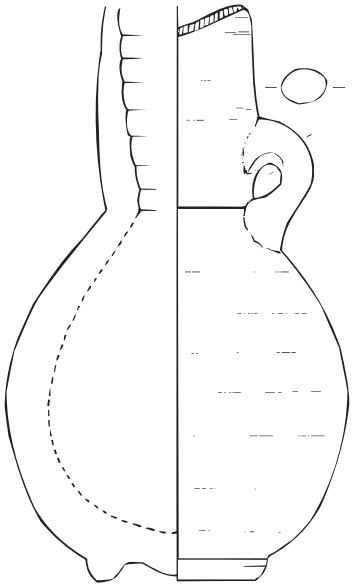
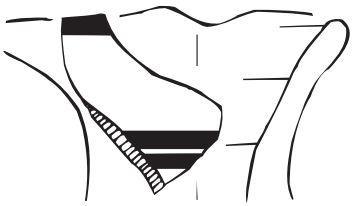


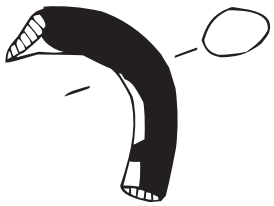
No. 072 Inv. No. P0692A, L0001

0 2cm



No. 073 Inv. No. P1041A, L1001

No. 074 Inv. No. P1093A, L1001



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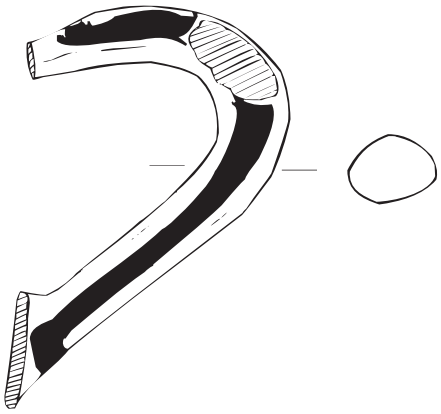

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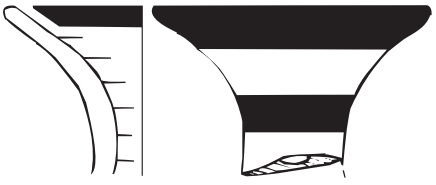


No. 077 Inv. No. P1097A, L1001

0 1cm

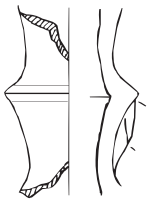
No. 078 Inv. No. P0376A, L1001

No. 079 Inv. No. P0377A, L1001

No. 080 Inv. No. P0368A, L1001

No. 081 Inv. No. P2005A, L0001

No. 082 Inv. No. P0210A, L1001



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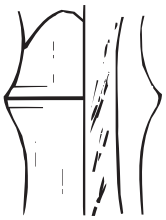
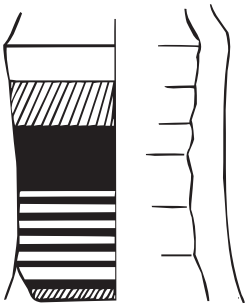


No. 084 Inv. No. P1179A, L1001



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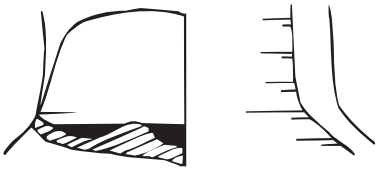
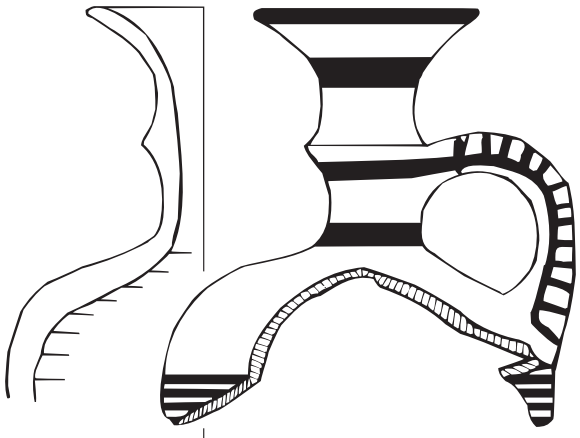


No. 086 Inv. No. P1046A, L1001



No. 087 Inv. No. P0362B, L1001

0 1cm

**TABLE I: EGYPTIAN FABRICS ACCORDING TO THE "VIENNA SYSTEM" AND OTHERS NOT INCLUDED THERE. A BRIEF DESCRIPTION***

| | |
|---|---|
| **Nile silt clay** | |
| Nile $B_1$ | Groundmass: relatively silty; inclusions of sand; micaceous particles; scattered fine straw particles as impressions in the clay and as silica skeletons of the plant structure. |
| Nile $B_2$ | The groundmass is similar in character to Nile $B_1$, but mineral and organic inclusions occur in larger sizes and in greater quantities. |
| Nile $C_1$ | Fairly silty clay with fine to coarse sand grains and a predominance of fine straw inclusions. |
| Nile $C_2$ | Fairly silty clay with fine to coarse sand grains and an abundace of coarse particles of straw inclusions. |
| Nile $E_1$ | Fine, medium and coarse rounded sand grains and fine straw inclusions. |
| Nile $E_2$ | Inclusions of fine, medium and coarse rounded sand grains. |
| **Egyptian marls** | |
| Marl $A_4$ | Marl A: a dense, homogenous groundmass containing fine mineral inclusions and very little organic matter. Variant 4: coarse texture and great quantity of fine to coarse sand inclusions, with a considerable range of colour, porosity and hardness. Colour: pink (7.5YR 7/4) to pale yellow (5Y 7/3). |
| Marl F | An eastern Nile Delta or North Sinai marl clay. In its most common form, the section fires an uniform very pale brown with a surface colour of white to dirty grey. Inclusions within the paste comprise sand, limestone grits and the occasional small pebble. Section: a uniform very pale brown colour; surface: white to dirty grey colour.<br>Variants: Marl F sandy, Marl F very sandy, and Marl F with ochre inclusions. |

*From: Arnold, Do. and J. Bourriau (Eds.), An Introduction to Ancient Egyptian Pottery (Mainz am Rhein, 1993), Fascicle 2, Ceramic Technology: Clays and Fabrics, by Hans Åke Nordström and J. Bourriau, 168-182. Aston, D., Egyptian Pottery of the Late New Kingdom and Third Intermediate Period (Twelfth-Seventh Centuries BC) (SAGA, 13; Heidelberg, Heidelberg Orientverlag, 1996), 9. Bietak, M., Tell el-Dab´a V. Wien (Österreichischen Akademie der Wissenschaften, 1991) 328. Cremonte, B., Non-local Pottery Fabrics from Tell el-Ghaba. A Preliminary Classification (see p.18 ff).

**TABLE II: TELL EL-GHABA IMPORTED FABRIC TYPOLOGY. A BRIEF DESCRIPTION***

| Fabric classification | | Fabric description |
|---|---|---|
| **North Sinai /South Palestine fabrics (II)** | II.TG 08 | Soft fabric. Inclusions: Ochre [2] small to very large, rounded. Sand [2] fine and medium. Black particles [1] small. Light brown particles [1] tabular and thin. |
| | II.TG 09 | Soft fabric. Inclusions: Ochre [1] medium to very large. Sand [3] fine. Black particles [1] small. Some light brown large and rounded inclusions (clay nodules?). Whitish particles [1] fine, angular and tabular. Organic material [1] [1] small, rounded, calcinated. |
| | II.TG 10 | Soft fabric. Inclusions: Ochre [1] small and rounded. Sand [3] fine to medium rounded vitreous and milky quartz. Black particles [1] small and rounded. Whitish particles [1] fine to large. Probable clay nodules and small rounded brown zones. |
| | II?TG 47 | Hard fabric. Inclusions: Ochre [1] fine to medium, rounded. Sand [2] medium [1] coarse, vitreous and pinkish quartz, rounded. Limestone? [1] fine to coarse, rounded. Black particles [1] small and rounded. Whitish particles [1] fine to medium, rounded. |
| | II?TG 59 | Medium hard fabric. Inclusions: Ochre [2] small to large, rounded. Sand [1] fine. Limestone [2] small, very scarce large and rounded. Black particles [1] small. Forams [1] small and medium. Mica [1] as muscovite points. Brown particles [1] large, rounded and tabular. Straw [1] as long and thin voids. Clay nodule: large and light brown. |
| **Levantine fabrics (IV)** | IV.TG 01 | Medium hard fabric. Inclusions: Ochre [1] fine [1] coarse. Sand [2] fine. Limestone [2] fine, scarce medium and coarse zones. Black particles [1] fine. Forams [1] fine. |
| | IV.TG 03 | Medium hard fabric. Inclusions: Ochre [1] fine to coarse. Sand [1] fine to medium, rounded and angular quartz. Limestone [1] fine [1] coarse and very coarse. Black particles [1] probably calcinated organic material. Forams [2]. |
| | IV.TG 05 | Hard fabric. Inclusions: Ochre [1] small. Sand [1] medium. Limestone [1] small [1] large. Black particles [1] small and medium. Forams [1]. |
| | IV.TG 06 | Medium hard fabric. Inclusions: Ochre [1] tiny. Sand [2] fine. Limestone [2] small and medium, rounded. Black particles [1] small. Forams [1] small. |
| | IV.TG 07 | Hard fabric. Inclusions: Ochre [1] small and large. Sand [1] medium (vitreous quartz and reddish brown translucent particles). Limestone [2] small to large (oxidized edges). Black particles [1] medium. Forams [1]. Mica [1] probably muscovite. Straw: a large black and rectangular inclusion (4 mm) in the grey core. |
| | IV.TG 11 | Medium hard fabric. Inclusions: Ochre [1] small [1] large. Sand [1] fine, quartz and scarce translucent red particles. Limestone [2] small and medium with oxidized edges. Black particles [1] small and medium, rounded. |
| | IV.TG 16 | Low hardness fabric. Inclusions: Ochre [1] small and rounded. Limestone [1] small and rounded. Black particles [1] small and medium, rounded. Forams [1] small. Shell [1] small. Orange particles: [3] small to very large, tabular with angular edges, orange fine grained rock like shale with abundant iron oxides. |
| | IV.TG 17 | Hard fabric. Inclusions: Ochre [1] small. Sand [1] fine and medium. Limestone [1] small to large. Black particles [1] tiny. Forams [1]. |
| | IV.TG 18 | Low hardness fabric. Inclusions: Sand [3] fine to coarse rounded vitreous quartz. Limestone [2] small to very large, angular and rounded (soft). Mica [1] tiny (as probable muscovite points). Some calcinated organic material (chaff?). |

| Fabric classification | | Fabric description |
|---|---|---|
| **Levantine fabrics (IV)** | IV.TG 19 | Very hard fabric. Inclusions: Ochre [1] scarce and fine. Sand [1] fine. Rounded and some angular quartz. Limestone [2] small and medium, rounded and angular. Black particles [1] small to medium pebbles. Forams [1] very scarce and small. |
| | IV.TG 21 | Medium hard fabric. Inclusions: Ochre [1] tiny. Sand [1] fine, angular vitreous quartz. Limestone [2] small to medium, rounded. Black particles [1] small and rounded. A few straw hues and probable shell. |
| | IV.TG 23 | Medium hard fabric. Inclusions: Ochre [1] small and rounded. Sand [1] fine (vitreous rounded quartz). Limestone [2] small to large, rounded. The large ones, very scarce. Black particles [1] small and rounded. Red particles [1] small and angular. Forams [1]. Probably clay nodules. |
| | IV.TG 24 | Medium hard fabric. Inclusions: Ochre [1] small to medium. Sand [1] fine to medium: milky quartz and tiny red translucent particles. Limestone [2] small and [2] large and very large. Black particles [1] small. Forams [1]. |
| | IV.TG 25 | Hard fabric. Inclusions: Ochre [1] small. Sand [1] fine to medium. Limestone [1] medium to large. Black particles [1] small and medium rounded pebbles. Forams [2] medium a very clear. |
| | IV.TG 29 | Medium hard fabric. Inclusions: Ochre [1] fine and medium. Sand [2] fine (rounded vitreous and milky quartz). Limestone [1] fine. Black particles [1] fine. Forams [1]. One probable clay nodule or grog. |
| | IV.TG 31 | Medium hard fabric. Inclusions: Ochre [1] small [1] medium, rounded. Sand [1] small and medium vitreous quartz. Limestone [2] small to large, rounded and angular. Black particles [1] small and medium, rounded and angular. Forams or shell [1]. |
| | IV.TG 32 | Very hard fabric. Inclusions: Ochre [1] small and rounded. Sand [1] fine, rounded vitreous quartz. Limestone [2] small and rounded. Black grit [1]. Forams [1]. Mica [1] as points of muscovite. |
| | IV.TG 36 | Hard fabric. Inclusions: Ochre [2] small to large, rounded. One of them very large and tabular. Sand [1] fine to medium rounded vitreous quartz. Limestone [2] small to large, angular, very scarce rounded. Black particles [1] small to medium, angular and rounded. |
| | IV.TG 51 | Hard fabric. Inclusions: Ochre [2] fine to coarse, rounded and tabular with tiny inclusions and forams inside. Sand [2] fine to medium (vitreous quartz). Limestone [2] fine and medium, rounded. Black particles [2] small, rounded, tabular and angular. One large and rounded black inclusion (burnt seed?). Forams or shell [1]. |
| | IV.TG 52 | Hard fabric. Inclusions: Ochre [2] fine to coarse, rounded and tabular with tiny inclusions and forams inside, coarse particles are very common. Sand [2] fine to medium (vitreous quartz). Limestone [2] fine and medium, rounded. Black particles [2] small, rounded, tabular and angular. Forams or shell [1]. |
| | IV.TG 53 | Medium hard fabric. Inclusions: Ochre [1] small [1] medium, rounded. Sand [2] fine [1] medium, rounded vitreous quartz. Limestone [1] small. Black particles [2] small [1] medium, rounded. Forams ? [1] small. |
| | IV.TG 57 | Medium hard fabric. Inclusions: Ochre [1] small and rounded. Sand [2] fine [1] medium, rounded vitreous quartz and scarce reddish translucent particles. Limestone [1] small and medium, rounded, tabular and angular. Black particles [1] small [1] medium, rounded and angular. Forams [1] small. Mica [1] fine |

| Fabric classification | | Fabric description |
|---|---|---|
| **Levantine fabrics (IV)** | IV.TG 57 | (muscovite). Grey particles [1] small. Straw [1]. |
| | IV.TG 61 | Hard fabric. Inclusions: Ochre [3] fine to coarse, rounded with tiny inclusions inside. Some of them look like grog. Sand [2] fine to coarse rounded vitreous and milky quartz. Limestone [2] fine to coarse, rounded. Black particles [2] small and medium, translucent and rounded. Mica [1] as scarce points. Greyish particles [1] small. Probable forams. |
| **(Phoenicians)** | IV.TG 13 = Phoen.05 | Hard fabric. Inclusions: Ochre [1] fine to medium. Sand [2] fine . Limestone [1] fine. |
| | IV.TG 22 = Phoen.04 | Hard fabric. Inclusions: Ochre [1] fine and medium, rounded. Sand [1] fine to medium. Limestone [1] fine and rounded, medium very scarce. Black particles [1] fine and rounded. Mica [1] fine and very clear (muscovite). Forams [1] fine. |
| | IV.TG 35 = Phoen.01 | Very hard fabric. Inclusions: Ochre [1] small. Sand [1] fine. Rounded vitreous quartz. Limestone [1] small and rounded. Black particles [1] small and rounded. Forams [1] small, very scarce. Mica [1] points of muscovite. Red particles [1] small and rounded. |
| | IV.TG 37 = Phoen.03 | Medium hard fabric. Inclusions: Ochre [1] medium, angular. Sand [1] fine, rounded vitreous quartz. Limestone [2] fine to very large, rounded and angular. One tabular inclusion (6 mm). Black particles [1] small and rounded. Forams [2] small. Shell [1] small. Mica [1] points of muscovite. Black particles [1] medium and rounded, probably clay nodules. |
| | IV.TG 38 = Phoen.02 | Medium hard fabric. Inclusions: Ochre [2] small and medium, rounded. Sand [2] fine, rounded vitreous quartz. Limestone [2] small to very large, rounded and sub-angular. Black particles [1] small and medium, rounded. Forams [1] small. Red particles [1] small and medium, rounded. Some light and rounded inclusions (clay nodules or organic material?). Distribution: non uniform. |
| **Cypriote fabrics (VI)** | VI.TG 04 | Soft fabric. Inclusions: Ochre [1] fine to coarse, rounded and dark orange. Sand [1] fine. Limestone [1] small [1] medium to large. Black particles [1] small. Forams [1]. |
| | VI.TG 40 | Medium hard fabric. Inclusions: Ochre [1] fine and rounded. Sand [2] fine, rounded vitreous quartz. Limestone? [1] scarce and fine. Black particles [2] small. Mica [1] as tiny points. Distribution: uniform. |
| | VI.TG 42 | Medium hard fabric. Inclusions: Sand [2] fine [1] medium and coarse, rounded and angular. Limestone? [1] medium and large, rounded. Black particles [1] small and medium, rounded. Brown particles [1] large and rounded. Mica [1]. Presence of salts. |
| | VI.TG 43 | Medium hard fabric. Inclusions: Ochre [1] fine , rounded. Sand [2] fine to medium, vitreous quartz. Limestone [1] small and rounded. Black particles [1] fine to medium, rounded, angular and tabular. Mica? |
| | VI.TG 44 | Soft fabric. Inclusions: Ochre [2] fine to large, rounded. Sand [1] fine to large, rounded vitreous quartz. Limestone [1] fine to large, rounded. Black particles [1] fine and rounded. Forams ? [1] fine. Mica?. |
| | VI.TG 49 | Quite soft fabric. Inclusions: Ochre [1] small to large, rounded. Sand [1] fine and medium rounded vitreous quartz. Limestone? small to large, rounded. Black particles [2] small to large, angular and rounded. Forams [1] fine. Whitish, brown and dark particles [2] fine to coarse and a probable clay nodule (light and rounded). |
| **Aegean fabrics (VII)** | VII.TG 39 | Medium hard fabric. Inclusions: Ochre [1] very fine and rounded. Sand [2]. |
| | VII.TG 41 | Medium hard fabric. Inclusions: Limestone [1] small and medium, rounded. Black particles [1] small, rounded. |

| Fabric classification | | Fabric description |
|---|---|---|
| **Aegean fabrics (VII)** | VII.TG 45 | Hard fabric. Inclusions: Sand [1] very fine. Black particles [1] tiny and very scarce. |
| | VII.TG 46 (Chian) | Medium hard fabric. Inclusions: Ochre [1] small and rounded. Sand [2] medium, vitreous quartz. Whitish particles [1] fine to large rounded. Black particles [1] small and large, rounded. Mica [1] points of muscovite. One large and rounded yellowish brown particle (limestone?). |
| | VII.TG 48 (Samian) | Medium hard fabric. Inclusions: Ochre [2] small (predominant) to large, rounded. Sand [1] fine [1] medium, rounded vitreous quartz. Limestone [2] small (predominant) to large, rounded. Black particles [2] small and rounded. Forams [1] very scarce and small. Mica [1] few points of muscovite. |
| | VII.TG 58 | Hard fabric. Inclusions: Ochre [1] small to very large, rounded. Sand [2] fine to coarse (rounded vitreous quartz). Limestone [1] fine and rounded. Forams [1] small. Grey particles [2] fine to coarse, rounded and soft. Black particles [1] fine. One whitish translucent inclusion, some brown particles and a burnt organic inclusion. |

* From: Cremonte, B., Non-local Pottery Fabrics from Tell el-Ghaba. A Preliminary Classification (see p. 18 ff).

# A Vessel Deposit from Tell el-Ghaba

**by Claudia Kohen and Adriana M. Chauvin***

**Abstract**

During the 1997 season at Tell el-Ghaba, a group of vessels was noticed in a dune. It was partially uncovered and its location was far north from the place we were actually excavating (see general plan in Plan I). That part of the site had been recently disturbed by bulldozers.[1]

Since the deposit was found in a dune without any association to archaeological features, its chronology seems to be uncertain. Vessels were compared to similar ones recovered from archaeological sites in Egypt and those that could be dated correspond to the late Roman and early Islamic periods.

## The vessels

The group consisted of medium-large vessels, placed vertically and upside down without stoppers. The deposit was buried in clean sand, without any association of charcoal or any other organic material (Plate I and Fig.1:3). Ten complete vessels were recovered; another eleven, partially broken, were later restored in the lab. They were analyzed and classified during November 1997. The vessels were washed and their contents reserved for later analysis. According to a palinologist from Dr. Hadidi's team[2], these contents seem to be only clean sand.[3]

Of the twenty-two vessels analysed, seventeen correspond to the storing type, one is a *qadus* (knobbed vessel), one is an amphora, two are cooking pots, and two sherds from a vessel, probably a storage jar. All the vessels were shaped on a fast wheel and made of Nile clay with the exception of the amphora, made of marl clay. The fabrics were studied on freshly made breaks, with magnifying hand lenses of 10 and 20 enlargements.

All pieces were inventoried, drawn on a 1:1 scale and photographed. The description of the vessels is presented below, in *The Catalogue.*

### Storage jars

They are ovoid-shaped with a flat base (**Nos. 1 to 17; Nos. 1-2 and 9:** Fig.1:1). Some vessels present neck and lip and are fully or partially ribbed. The average height is 45 cm and the maximum width is between 28 and 30 cm. The rims respond to two different morphologies, which have not been identified in the bibliography until now. The colour of the surface is reddish without slip.

Grzegorz Majcherek[4] thinks that these vessels are rather unusual; they could be identified as Islamic water-jars. Similar vessels were reported from his excavations in

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**Notes**

* 2002.

[1] P. Fuscaldo, "Tell el-Ghaba (North Sinai)", *BCE XXI* (2000), 3-6; P. Fuscaldo, S. Lupo, B. Cremonte and S. Basílico, "A Preliminary Report on the Pottery from Tell el-Ghaba, a Saite Settlement in North Sinai", in Z. Hawass (ed.), *Egyptology at the Dawn of the Twenty-first Century. Proceedings of the 8th. International Congress of Egyptologist, Cairo, March 23rd –April 3rd, 2000* (The American University in Cairo, Cairo, 2002), vol. 1, Archaeology, 189-194; V. Pereyra, E. Crivelli, S. Lupo, S. Fantecci, A. Zingarelli, "Tell el-Ghaba: Three Seasons of Excavation in North Sinai". *Centenary of Mediterranean Archaeology at the Jagiellonian University 897-1997* (Cracow, 1999), 59-73.

[2] From Cairo University.

[3] Our sincerest thanks to Dr. El-Hadidi and his team for their cooperation.

[4] Director of the Polish Mission at Kom el-Dikka.

Alexandria and were tentatively dated to the 10th-11th Century AD. The other possibility is to identify these pieces as *pigeon pots,* usually associated with farmhouses of Roman and Islamic periods.[5]

**The *qadus***

It presents a ribbed body of ovoid shape (**No. 18**, Inv. No. P0550A, Fig.1:1). It is 36.40 cm high and 22.0 cm width at the major diameter, with a rim of 16.0 cm; the vessel index is 60. It is partially smoked. It has morphological similarities with the Tôd pottery[6]. In Tôd, this type of vessel was found in all the levels and in most cases there are traces of domestic reuse. This may also have happened in the Tell el-Ghaba depository, since our samples are partially smoked. The estimated chronology spans from late 7th Century to the beginnings of 13th Century AD, and Pierrat groups them in the LIII-IV fabrics. In the South Church of the el-Ashmunein, similar types to those that Bailey calls *sakiya-pots*[7] appear, and have been dated as late as the 4th Century and beginning of the 5th Century AD. In the Dra `Abu el-Naga necropolis we also found a vessel[8] whose fabric matches the Pierrat LIII group.

The function of this vessel has been described by Bailey: "The qadus, the pot of water lifting mechanisms, was a necessary part of the life in Roman Egypt, and fragments of 122 examples were found below the South Church. They have wide mouths with constricted necks and a knobbed foot, both features enabling them to be lashed to the vertical wheel of the sakiya or to form a chain of such pots passing over the vertical wheel. The mouth normally has a thickened rim of distinctive shape, but one capable of receiving innumerable variants from the hands of the potters. The body is deep and very often ribbed. The clay is of the normal Nile silt and most fabrics are micaceous and often very micaceous".[9]

**Cooking pots**

One of the pieces (**No. 19**, Inv. No. P0552A, Fig.1:2) is 24.7 cm high and 21.5 cm of maximum width. It is burnt and shows an important degree of destruction. The other (**No. 20**, Inv. No. P0553A, Fig.1:2) is 29.5 cm high and 28 cm of maximum width. Its surface is particularly smoked.

**The Amphora**

It is 40.5 cm high and 27.5 cm of maximum width. It stands out both for its type of fabric (Marl F) and for its decoration of incised lines in a horizontal, waving pattern, in the lower part of the body (**No. 21**, Inv. No. P0548A, Fig. 1:2).

# Catalogue

**Nile silt clay**
***Household ware***
**Storage jars**

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[5] The authors kindly acknowledge the support given by Dr. G. Majcherek.

[6] G. Pierrat, "Essai de classification de la céramique de Tôd de la fin du VII siècle au début du XIII siècle ap. J.C.", *CCE* 2 (1991), 145-204. See page 147 for general description of fabrics Group L, and page 149 for fabrics Group LIII and IV.

[7] D. Bailey, "The Pottery from the South Church at El-Ashmunein", *CCE* 4 (1996), 47-86, fig. 29.

[8] D. Polz, "Bericht über die 4. und 5. Grabungskampagne in der Nekropole von Dra `Abu el-Naga/ Theben-West", *MDAIK* 51 (1995), 218, fig 6.

[9] D. Bailey, *CCE* 4, 70.

**No. 1: storage jar (**Fig. 1:1), Inv. No. P0557A (Drawing No. 0177)

| | | | | | |
|---|---|---|---|---|---|
| Uncoated | Nile clay | $W_2$ | W | ox. | 2 |

Complete; fragmentary, mended; exterior lip, flattened base. Rd: 11.0 cm; Nd: 9.40 cm; Md: 27.70 cm; Wd: 0.70 cm; $H_1$: 44.00 cm; $H_2$: 12.00 cm. VI: 61. 2.5YR 4/8 dark red. Break: 2.5YR 4/6 dark red. Inclusions: limestone, sand, spots of clay. Ribbed body; partially eroded on the exterior. Smoothed. *Find No.002*.

**No. 2: storage jar** (Fig. 1:1), Inv. No. P0551A (Drawing No. 0163)

| | | | | | |
|---|---|---|---|---|---|
| Uncoated | Nile clay | $W_2$ | W | ox. | 2 |

Complete; mended; exterior lip with a ledge; rounded base. Rd: 12.50 cm; Nd: 11.00 cm; Md: 29.50 cm; Wd: 1.10 cm; $H_1$: 47.00 cm; $H_2$: 12.00 cm; $H_3$: 5.80 cm. VI: 62. 2.5 YR 5/6 red. Break: ---. Ribbed on the upper part of the body and above the base; the body and the base were done separately and then joined; white zones (calcium carbonate concretions) on the exterior. Smoothed. *Find No. 014*.

**No. 3: storage jar**, Inv. No. P0549A (Drawing No. 0164)

| | | | | | |
|---|---|---|---|---|---|
| Uncoated | Nile clay | $W_2$ | W | --- | 2 |

Complete; fragmentary; mended; exterior lip; round base. Rd: 11.10 cm; Nd: 9.20 cm; Md: 28.50 cm; Wd: 0.80 cm; $H_1$: 45.50 cm; $H_2$: 12.00 cm. VI: 62. 2.5YR 4/6 dark red. Break: 2.5YR 4/8 dark red; presence of salt. Inclusions: straw, limestone (abundant), coarse sand. Ribbed body; several string marks on the body; eroded exterior. Smoothed. *Finds Nos. 001 and 009*.

**No. 4: storage jar**. Inv. No. P0555A (Drawing No. 0176)

| | | | | | |
|---|---|---|---|---|---|
| Uncoated | Nile clay | $W_2$ | --- | ox. | 2 |

Incomplete, mended; base not preserved. Rd: 10.90 cm; Nd: 9.00 cm; Md: 25.00 cm; Wd: 1.20 cm; $H_1$: 43.50 + x cm. 2.5YR 5/6 red. Break: 2.5YR 4/8 dark red. Inclusions: sand. Ribbed body; a groove on the lip. Smoothed. *Finds Nos. 018 and 019*.

**No. 5: storage jar**. Inv. No. P0554A (Drawing No. 0174)

| | | | | | |
|---|---|---|---|---|---|
| Uncoated | Nile clay | $W_2$ | --- | ox. | 2 |

Incomplete, mended; rim and base not preserved; Nd: 10.00 cm; Md: 24.00 cm; Wd: 0.90 cm; $H_1$: 42.00 + x cm. 2.5YR 4/6 – 3/6 dark red. Break: 5YR 5/1 grey core; 2.5 YR 4/6 dark red oxidation zones. Inclusions: quartz; limestone, chaff and straw, sand, ochre, charcoal. The fabric is gritty and porous. Ribbed body; well fired. Smoothed.

**No. 6: storage jar**, Inv. No. P0556A (Drawing No. 0152)

| | | | | | |
|---|---|---|---|---|---|
| Uncoated | Nile clay | $W_2$ | W | ox. | 2 |

Incomplete, mended; no rim preserved; round base, Md: 29.00 cm; Wd: 1.00 cm; $H_1$: 37.00 + x cm; $H_2$: 11.00 cm. 5 YR 5/8 yellowish red. Break: 5YR 4/1 dark grey core; 2.5 YR 4/4 dusky red oxidation zones. Inclusions: limestone (abundant), straw (abundant); charred chaff. Ribbed on body and base; very eroded exterior. Smoothed. *Find No. 021*.

**No. 7: storage jar,** Inv. No. P0558A (Drawing No. 0178)

| | | | | | |
|---|---|---|---|---|---|
| Uncoated | Nile clay | $W_2$ | W | ox. | 2 |

Incomplete, fragmentary, mended; uncoated surface, rim not preserved, round base. Md: 24.00 cm; Wd: 1.40 cm; $H_1$: 40.00 + x cm; $H_2$: 11.50 cm. 2.5YR 4/6 dark red. Break: 2.5YR 4/8 dark red. Inclusions: limestone, sand, clay spots. Ribbed body; very eroded and smoked exterior. Smoothed. *Finds Nos. 001 and 009.*

**No. 8:** s**torage jar**, Inv. No. P0559A (Drawing No. 0191)

| Uncoated | Nile clay | $W_2$ | W | ox. | 2 |
|---|---|---|---|---|---|

Incomplete, fragmentary, mended; uncoated surface, exterior lip. Nd: 9.90 cm; Wd: 0.90 cm; $H_1$: 28.00 + x cm. 2.5YR 4/4 dusky red. Break: 2.5YR 4/8 dark red. Inclusions: limestone, sand, clay spots. Grooves on the neck, ribbed body; eroded exterior. Smoothed. *Find No. 023*.

**No. 9:** s**torage jar** (Fig. 1:1), Inv. No. P0546A (Drawing No. 0138)

| Uncoated | Nile clay | $W_2$ | W | ox. | 2 |
|---|---|---|---|---|---|

Complete; exterior lip trimmed, round base. Rd: 10.00 cm; Nd: 8.10 cm; Md: 24.20 cm; Wd: 1.00 cm; $H_1$: 39.50 cm; $H_2$: 11.00 cm; $H_3$: 4.40 cm. VI: 61. 2.5YR 4/8 dark red. Break: ---. Inclusions: ---. Ribbed body; a small hole in the base. Smoothed. *Find No. 006*.

**No. 11: storage jar**, Inv. No. P0543A (Drawing No. 0121)

| Uncoated | Nile clay | $W_2$ | W | ox. | 2 |
|---|---|---|---|---|---|

Complete; incurved rim, exterior lip; round base. Rd: 11.00 cm; Nd: 8.90 cm; Md: 27.00 cm; Wd: ca.1.00 cm; $H_1$: 46.00 cm; $H_2$: 11.00 cm. VI: 59. 2.5YR 4/1 dark reddish grey. Break: ---. Inclusions: ---. Ribbed on the upper part of the body; a small hole above the base; very eroded exterior, partially covered by a dark grey sediment. Smoothed. *Find No. 007*.

**No. 12: storage jar**, Inv No. P0545A (Drawing No. 0165)

| Uncoated | Nile clay | $W_2$ | W | ox. | 2 |
|---|---|---|---|---|---|

Incomplete, fragmentary, rim not preserved. Md: 25.30 cm; Wd: 1.00 cm; $H_1$: 34.00 + x cm; $H_2$: 13.00 cm. 2.5YR 4/6 dark red. Break: 2.5YR 5/8 red. Inclusions: straw, sand (few). Ribbed body with two small holes (1 cm diameter) between neck and shoulder on both sides and one hole in the base; eroded exterior. *Find No. 017*.

**No. 14:** s**torage jar**, Inv. No. P0544A (Drawing No. 0167)

| Uncoated | Nile clay | $W_2$ | W | ox. | 2 |
|---|---|---|---|---|---|

Incomplete, fragmentary, broken neck, rim not preserved. Md: 24.00 cm; Wd: 1.20 cm; $H_1$: 41.00 + x cm; $H_2$: 13.00 cm. 2.5YR 3/6 dark red. Break: 2.5YR 4/8 dark red. Inclusions: quartz, straw (few), dung, sand. Base made on the wheel, ribbed body; eroded; white zones on the surface (calcium carbonate concretions). Smoothed. *Find No. 015*.

- Nile $B_2$

**No. 10:** s**torage jar**, Inv. No. P0541A (Drawing No. 0120)

| Uncoated | Nile $B_2$ | $W_2$ | W | ox. | 2 |
|---|---|---|---|---|---|

Complete; fragmentary; incurved rim; round base. Rd:11.00 cm; Nd: 9.00 cm; Md: 23.00 cm; Wd: 1.00cm; $H_1$: 44.00 cm; $H_2$: 10.00 cm; $H_3$: 10.40 cm. VI: 52. 2.5YR 3/3 dusky red. Break: 2.5YR 4/1 dark reddish grey. Inclusions: straw (few). Ribbed body; base made on the wheel; a small hole in the base. Smoothed. *Find No. 010*.

**No. 13: storage jar**, Inv. No. P0540A (Drawing No. 0118)

| Uncoated | Nile $B_2$ | $W_2$ | W | ox. | 2 |
|---|---|---|---|---|---|

Complete; fragmentary; straight neck, direct rim; flattened base. Rd: 8.00 cm; Nd: 8.30 cm; Md: 20.40 cm; Wd: 1.00 cm; $H_1$: 31.00 cm; $H_2$: 7.80 cm. VI: 65. 2.5YR 3/4 dusky red. Break: 10R 4/8 red. Inclusions: straw. Ribbed body. Smoothed. *Find No. 005*.

**No. 15: storage jar**, Inv. No. P0547A (Drawing No. 0166)

| Uncoated | Nile $B_2$ | $W_2$ | W | ox. | 2 |
|---|---|---|---|---|---|

Incomplete; fragmentary; the upper part of the vessel is broken; no rim preserved; round base. Md: 23.00 cm; Wd: 1.50 cm; $H_1$: 40.00 + x cm; $H_2$: 11.00 cm. 2.5YR 4/4 dusky red. Break:

2.5YR 4/6 dark red. Inclusions: straw, dung. Ribbed on the upper body and on the base; partially eroded exterior. Smoothed. *Find No. 011*.

**No. 16: storage jar**, Inv. No. P0542A (Drawing No. 0136)

| Uncoated | Nile $B_2$ | $W_2$ | W | ox. | 2 |
|---|---|---|---|---|---|

Incomplete, fragmentary; rim not preserved; flattened base. Nd: 10.40 cm; Md: 30.00 cm; Wd: 1.10 cm; $H_1$: 40.50 + x cm; $H_2$: 11.0 cm. 10R 3/1 dark reddish grey. Break: 10R 4/1 dark reddish grey. Inclusions: straw (few), dung. Ribbed on the upper body. Smoothed. *Find No. 008*.

**No. 17: storage jar**, Inv. No. P0560A (Drawing No. 0211)

| Uncoated | Nile $B_2$/ $C_1$ | $W_2$ | W | ox. | 2 |
|---|---|---|---|---|---|

Incomplete, fragmentary, mended; rim and upper part of the body preserved; rounded base. Md: 20.00 cm; Wd: 1.50 cm; $H_1$: 24.50 + x cm; $H_2$: 12.00 cm. 2.5YR 5/4 weak red. Break: 2.5YR 4/8 dark red. Inclusions: chaff, limestone (occasionally). Eroded exterior, salt incrusted, exfoliated. Smoothed. *Finds No. 018 and 019*.

**The qadus**

**No. 18: qadus** (Fig. 1:1), Inv. No. P0550A (Drawing No. 0143)

| Uncoated | Nile clay | $W_2$ | W | ox. | 2 |
|---|---|---|---|---|---|

Complete, fragmentary; mended. Rd: 16.00 cm; Md: 22.00 cm; Wd: 0.80 cm; Fd: 4.10 cm; $H_1$: 36.40 cm; $H_2$: 18.00 cm; $H_4$: 3.50 cm. VI: 60. 2.5YR 4/6 dark red. Break: 2.5YR 4/4 dusky red. Inclusions: quartz, straw, ochre?, grog. Ribbed body; knobbed base made on the wheel and then joined to the body; partially smoked and eroded exterior. Smoothed. *Find Nos. 012-013*.

**Cooking pots**

**No. 19: cooking pot** (Fig. 1:2), Inv. No. P0552A (Drawing No. 0144)

| Uncoated | Nile clay | $W_2$ | W | ox. | 2 |
|---|---|---|---|---|---|

Complete; fragmentary; mended; incurved rim, round base. Rd: 11.70 cm; Md: 21.50 cm; Wd: 1.00 cm; $H_1$: 24.50 cm; $H_2$: 9.00 cm. VI: 90. 2.5YR 4/6 dark red. Break: ---. Inclusions: soup stone?, straw, sand. Ribbed base and upper body; burnt as in direct contact with fire. Smoothed. *Find No. 016*.

**No. 20: cooking pot** (Fig. 1:2), Inv. No. P0553A (Drawing No. 0147)

| Uncoated | Nile $E_1$ | $W_2$ | W | ox. | 2 |
|---|---|---|---|---|---|

Complete, fragmentary; mended; folded rim, round base. Rd: 14.00 cm; Md: 28.00 cm; Wd: 0.60 cm; $H_1$: 29.50 cm; $H_2$: 19.50 cm. VI: 95. 2.5YR 5/6 red. Break: 2.5YR 4/6 dark red. Inclusions: quartz, straw. Ribbed on upper body and base; smoked and very eroded on the exterior. Smoothed. *Find No. 004*.

**Amphora**

**No. 21: amphora** (Fig. 1:2), Inv. No. P0548A (Drawing No. 0141)

| Uncoated | Marl F | $W_2$ | W | ox. | 3 |
|---|---|---|---|---|---|

Complete; fragmentary; mended; exterior lip, applied loop handles, rounded base. Rd: 10.00 cm; Nd: 9.20 cm; Md: 27.50 cm; Wd: 0.60 cm; $H_1$: 40.50 cm; $H_2$: 7.30 cm; Hd: 3.30 x 1.80 cm;1 strap. VI: 67. 5GY 7/1 light greenish grey. Break: 5GY 6/1 greenish grey; the break is irregular and gritty. Inclusions: small and med. quartz; mica; few limestone; straw; silica skeletons; red grit and shell. Ribbed on the upper part of the body; strap handles: attachment from neck to body; two handles remain. Decoration: incised lines in a horizontal and waving pattern on the lower part of the body. Smoothed. *Find No. 020*.

**Sherds**

**No. 22:** sherds, Inv. No. P0561A$_{1-2}$ (Drawing No. 0217)

| | | | | | |
|---|---|---|---|---|---|
| Uncoated | Nile clay | $W_2$ | --- | ox. | 2 |

Two sherds with incised decoration; both are probably part of the same vessel. 1) Wd: 0.60 cm; $H_1$: 4.50 + x cm. 2) Wd: 0.60 cm; $H_1$: 5.10 + x cm. 2.5Y 8/3 pale yellow. Break: 2.5YR 4/8 dark red. Inclusions: quartz, mica, limestone, sand, clay spots. Decoration: incised lines in a horizontal and waving pattern. Smoothed.

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-Polz, D. ,"Bericht über die 4. und 5. Grabungskampagne in der Nekropole von Dra `Abu el-Naga/ Theben-West", *MDAIK* 51 (1995), 218.

## List of Figures and Plates

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**Fig. 1:2** No. 19, Inv. No. P0552A
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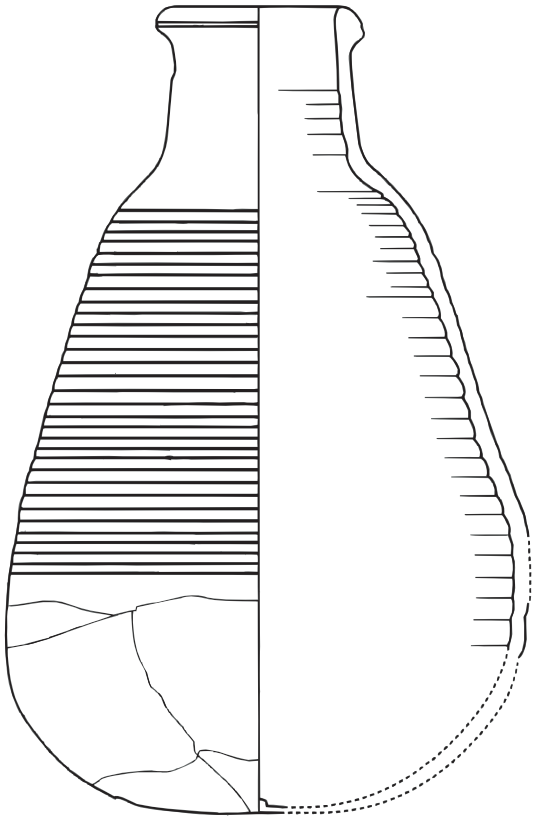
**Fig. 1:3** Sketch of the position of the vessels in situ
(Drawings by Claudia Kohen and Adriana Chauvin, digitised for publication by Perla Fuscaldo).

**Plate I:** The vessels in situ (Photograph by Claudia Kohen; digitised for publication by Perla Fuscaldo)



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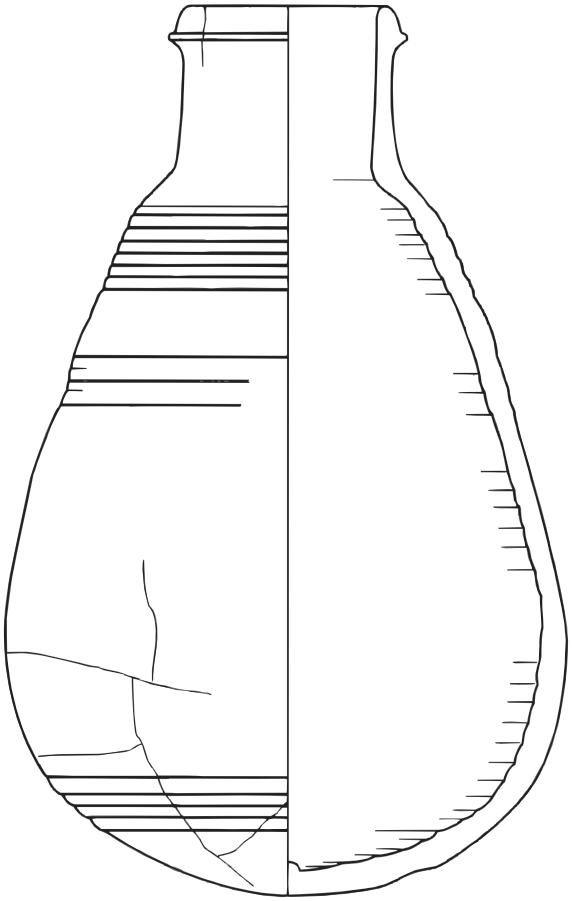

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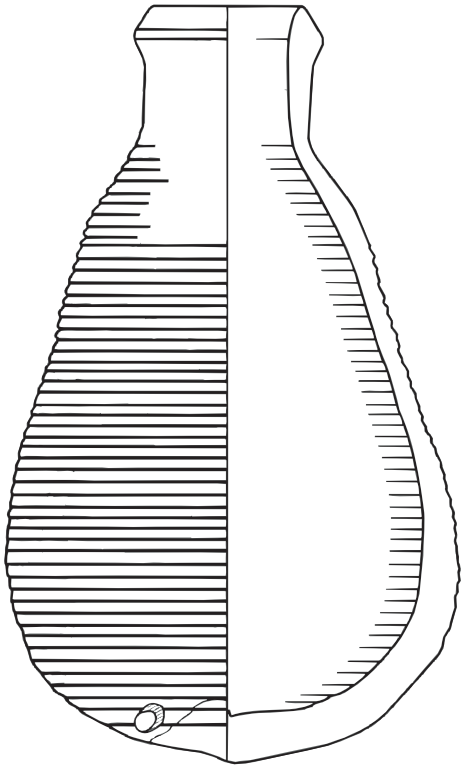

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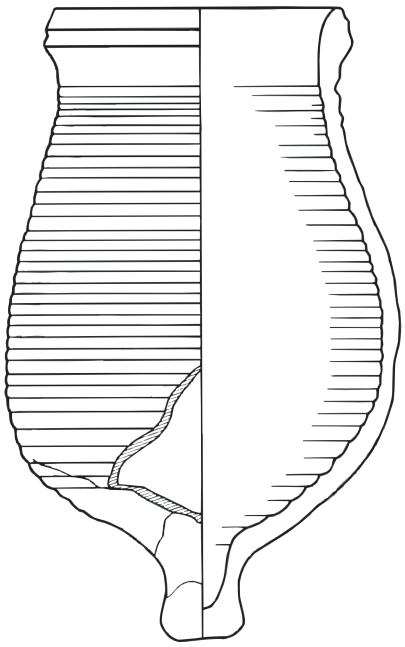

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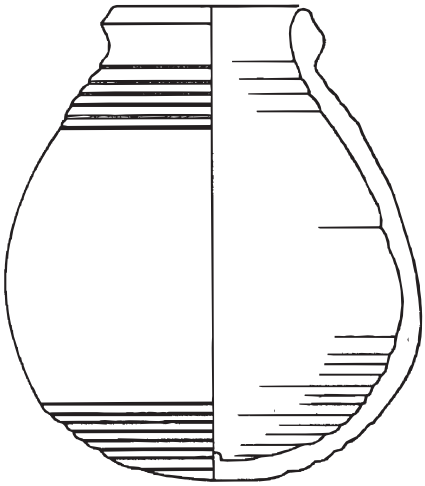
0 6 cm

Fig.1:1



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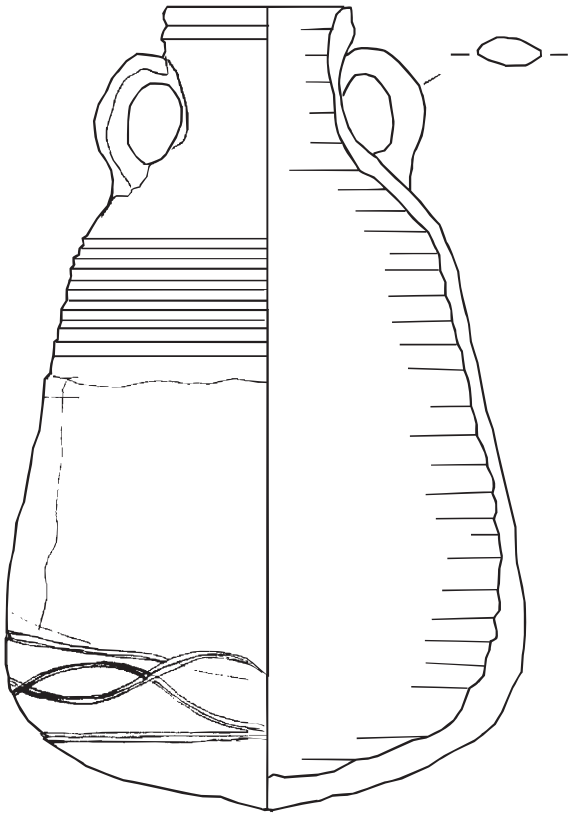

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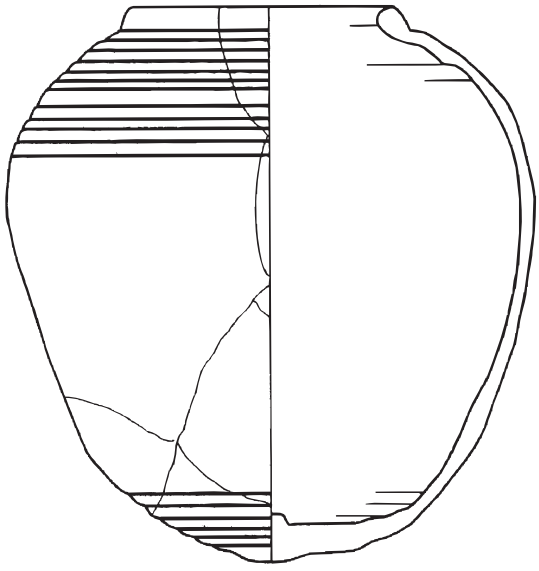

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0 6 cm

Fig.1:2

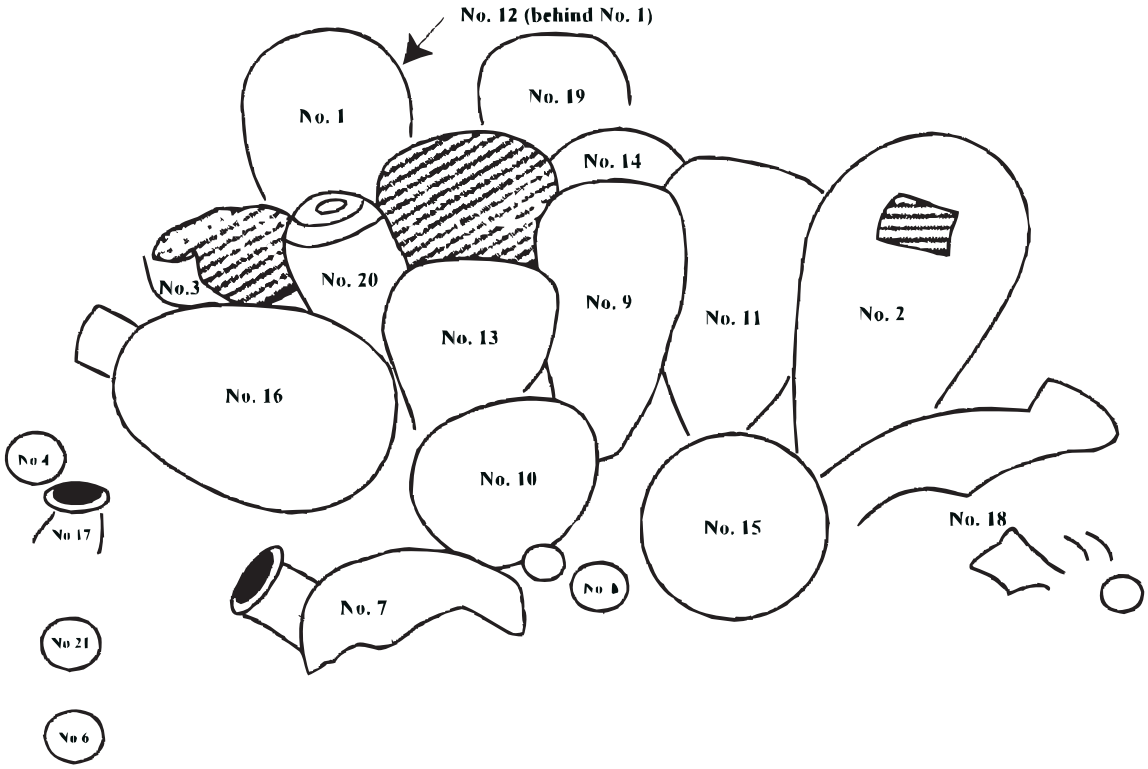

Plate I

Fig.1:3

# TELL EL-GHABA II

## Studies

### Fauna

# Fishes from Tell el-Ghaba

**by Alberto Luis Cione***

**Abstract**

Excavations in a site of the Saite Period (VII-VI century BC) in north Sinai (Egypt) have produced a remarkably large collection of fish bones. This appears to be the first published archaeoichthyological study for the Saite Period. It provides relevant information on the fish resources in north Sinai Peninsula during Late Dynastic times, when the eastern section of Delta still existed. The faunal evidence indicates that there was easy access to habitats with abundant freshwater fish contrasting with the present desertic environment.

Along with the fishes, marine and continental turtles, crocodiles, birds, and mammals were collected. Fishes constitute about 88% (NISP) of the vertebrate findings. The archaeoichthyofauna is dominated by catfishes (clariids, *Synodontis schall*: 65,26%), tilapias (*Oreochromis* sp.: 28,5%) and grey mullets (*Mugil* sp.: 4,41%).This is the only known site with comparatively abundant and diverse marine fishes (Sparidae, Sciaenidae, Mugilidae, Carcharhiniformes, Lamniformes, Batoidei: NISP: 6.55%, including *Mugil* sp.) in Pharaonic Egypt. There are also marine turtles. To our knowledge, only one vertebra of an elasmobranch was collected in other Pharaonic site. Several of the marine taxa are new for Pharaonic Egypt: *Sphyrna* cf. *lewini*, *Carcharhinus* cf. *oscurus*, Batoidei indet., *Carcharias taurus*, and a marine turtle. The most abundant fishes present in the sample inhabit shallow water environments and/or are organisms that can stand relatively high salinity. It is likely that most of the freshwater (and some of the marine) fish were caught in the nearby eastern lagoon.

**Keywords**

Ichthyofauna, Egypt, Sinai, Saite, Elasmobranchii, Teleostei, Late Dynastic, marine, fishes.

## Introduction

Relatively few archaeozoological analyses have been published from Pharaonic sites in comparison with the intense archaeological activity carried out during the last 200 years in Egypt. Tell el-Ghaba, a site in north Sinai (Egypt), has been surveyed by the Argentine Archaeological Mission since 1995. The pottery used as main chronological indicator pointed out to date Tell el-Ghaba as a Saite settlement of the beginning of the 26th Dynasty, from the second half of the reign of Psametichus I until the beginning of the Psametichus II (probably between 635 and 593 BC).[1] As a consequence of the fieldwork, Tell el-Ghaba has produced one of the largest fishbone assemblages for any period in Ancient Egypt along with many tetrapod remains. The area is presently desertic, but in late Pharaonic times, there was a major Nile branch in northwestern Sinai, the Pelusiac branch.[2] Certainly, it is not unexpectable to find such a large quantity of fish remains, taking into account that the physical environment of Egypt where water occurred contributed to the development of an efficient fishing industry.[3] Actually, fish were a cheap staple food. Their processing and conversion into dried and salted

**Notes:**

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[1] P. Fuscaldo, S. Lupo, B. Cremonte and S. Basílico, "A Preliminary Report on the Pottery from Tell el-Ghaba, a Saite Settlement in North Sinai", in Z. Hawass (ed.), *Egyptology at the Dawn of the Twenty-first Century,* I, 189-192.

[2] M. Bietak, *Tell el-Dab´a II* (Wien, 1975).

[3] D. J. Brewer and R.F. Friedman, *Fish and Fishing in Ancient Egypt* (Warminster, 1989).

products is demonstrated in many reliefs and wall paintings. Processing included the preparation of caviar from the roe of mullets. Pickled and dried fishes from the Nile Valley were also exported to other countries.[4]

North Sinai was a frontier area, the land bridge between Egypt and the Levant, where the so-called "The Ways of Horus" were and where many settlements were founded.[5] Tell el-Ghaba is one of these sites, located on the north shore of a lagoon between Tell el-Hebwa to the west and Tell el-Kedwa to the east.[6] Tell el-Ghaba was located near the Pelusiac branch, in the easternmost section of the Delta.[7] For this, notwithstanding its singularity, Tell el-Ghaba shares some faunistic characteristics with other sites located in the delta. The disappearance of the Pelusiac branch dramatically affected the distribution of aquatic fauna, which became restricted to more western areas.

As far as I know, this is the first published description of fishes from an archaeological site in Sinai and the Saite Period in Egypt. Lang[8] had only mentioned, without a description, the occurrence of what she called "lake sturgeon" in Tell el-Kedwa, near Tell el-Ghaba and there are some references of fishes in Naukratis. Besides, it is the only with a relatively high diversity of marine fishes in a Pharaonic site.[9] For this, Tell el-Ghaba includes a relevant source of information about the means of subsistence in the area.

In this paper, we describe the fish findings, analyze the taxic composition and possible provenance, and compare it with other sites.

## Methods

Vertebrate bones were picked by hand or collected by sifting the excavated earth of the occupation layers. More than 11000 vertebrate bones (including more than 9700 fish bones) from 192 loci were analyzed. There are still a large quantity of bone material to be examined from several other loci. The faunal material is deposited in the Argentine Mission storage room, located in the Archaeological Centre at Abu Seifa, Sinai where it has been studied.

The material was compared with the personal reference osteological collection of Alberto Luis Cione, collections of different institutions (the Senckenberg Museum of Frankfurt, the Natural History Museum of London, the American Museum of Natural History of New York, the Museo de La Plata of La Plata, the Museo Argentino de Ciencias Naturales "Bernardino Rivadavia" of Buenos Aires), and with bibliography.

Taxa have been identified to the most certain level possible. Due to the difficulties for identifying isolated bones of catfish genera *Clarias* and *Heterobranchus*, we refer the findings to *Clarias*/*Heterobranchus* (see below). All the bones identified as pertaining to the catfish genus *Synodontis* are referred to the species *Synodontis schall* because we only find bones that can be determined to species level of this species (e.g. abundant postcleithra).

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[4] D. Sahrhage, *Kulturgeschichte der antiken Welt* (Mainz, 1998).

[5] Bietak, *Tell el-Dab´a II*; J. K. Hoffmeier, J. K. and M. `Abd el-Maksoud, "A new military site on the "The Ways of Horus" – Tell el-Borg 1999-2001: a preliminary report", *JEA* 89 (2003), 169.

[6] P. Fuscaldo, S. Lupo, B. Cremonte and S. Basílico, "A Preliminary Report on the Pottery from Tell el- Ghaba, a Saite Settlement in North Sinai", in Z. Hawass (ed.), *Egyptology at the Dawn of the Twenty-first Century. Proceedings of the 8th International Congress of Egyptologists. The International Association of Egyptologists and The Supreme Council of Antiquities, Cairo, 23/3-3/4/2000* (The American University in Cairo, Cairo 2002), I, 189-192.

[7] B. Marcolongo, "Évolution du paléo-environnment dans la partie orientale du Delta du Nil depuis la transgression flandrienne (8000 B.P.) par rapport aux modèles de peuplement anciens", *CRIPEL* 14 (1992), 23; Hoffmeier and M. `Abd el-Maksoud, *JEA* 89, 169.

[8] C. Lang, "Preliminary report on the faunal analysis for Tell Qedwa", *JARCE* 36 (1998), 58.

[9] W. van Neer, "Archaeozoological data on the food provisioning of Roman settlements in the Eastern Desert of Egypt", *Archaeozoologia* 9 (1997), 137.

Names of fish skeletal elements are according to Wheeler and Jones[10] (teleost in general), Sasaki[11] (sciaenids), and Kosuch and Fitzgerald[12] (elasmobranchs).

The simplest method of estimating frequencies of taxa is to count the number of identifiable specimens (NISP) for each species in the assemblage. This approach is biased in favour of species, which possess large numbers of robust and easily recognized bones.[13] The minimum number of individuals (MNI) is the smallest number of individuals of one species that takes account of the anatomical pieces recovered. Along with the minimum number of identified specimens it is used to estimate relative taxon frequencies in assemblages.[14] Whichever method of quantification is adopted, it must always be remembered that the end result is an assessment based on a flawed sample in almost every case. It can never be an accurate picture of fish abundance and it is not justifiable to extrapolate from such data to the amount of protein represented by the bones.[15]

For estimate MNI, we used easily identifiable bones such as premaxilla, maxilla, mesethmoid, lateral ethmoid, vomer, hyomandibular, dentary, supraoccipital, cleithrum, pectoral and dorsal siluriform spines, anal pterigiophores. MNI was estimated taking into account the number and side of the skeletal elements and the loci where they have recovered. We did not use vertebrae excepting to express the presence of a taxon in the sample in the absence of other, more representative remain. In this case, the MNI is 1.

Arbitrary size categories were chosen: very small (less than 8 cm SL), small (8-20 cm), medium (20-60 cm), large (60-200), very large (more than 200 cm).[16]

**Abbreviations**

MNI: minimum number of individuals.
NISP: number of identified specimens.
SL: Standard length. Length from the anteriormost part of snout to the last vertebra.
TL: Total length. Length from the anteriormost part of snout to the end of caudal fin. Mostly used in chondrichthyans.
L: locus.

## Physical environment

### General y subdivisions

The northern part of Sinai occupies about 8000 km$^2$ of sand dunes, sheets of sand and salty marshes, with brackish groundwater and sparse vegetation.[17] Climate is arid. According to Köppen Classification, the nearby Port Said is classed BMhl.[18] However, the area was very different in the antiquity. Not only the northwestern part of Sinai constituted part of the Nile Delta plain before the IX century AD,[19] but also it was affected by marine transgressions and

[10] A. Wheeler and A. Jones, *Fishes* (Cambridge, 1989).

[11] K. Sasaki, "Phylogeny of the family Sciaenidae, with notes on its zoogeography (Teleostei, Perciformes)", M*emoirs of the Faculty of Fisheries Hokkaido University* 36 (1989), 1.

[12] L. Kosuch and C. Fitzgerald, "A guide to identifying shark centra from southeastern archaeological sites", *Southeastern Archaeology* 8 (1989), 146-157.

[13] Wheeler and Jones, *Fishes*.

[14] E. J. Reitz and E. S. Wing, *Zooarchaeology* (Cambridge, 1999).

[15] Wheeler and Jones, *Fishes.*

[16] Modified from Cione and Tonni (A. L. Cione and E. P. Tonni, "Paleoetnozoological context of a site of Las Lechiguanas Islands, Paraná Delta, Argentina", *El Dorado Bulletin* 3 (1978), 76) for including the marine fishes.

[17] A. Abu, *Landforms of Egypt* (Cairo, 1971); N. Greenwood, *The Sinai. A Physical Geography* (Austin, 1997).

[18] Greenwood, *The Sinai. A Physical Geography.*

[19] R. Said, *The River Nile. Geology, Hydrology and Utilization* (Oxford, 1993); G. A. Goodfriend and D.J. Stanley, "Rapid strand-plain accretion in the northeastern Nile Delta in the 9$^{th}$ century A.D. and the demise

desertification and eolian deposition. Thus, the ancient regional settlement system was conditioned not only by freshwater bodies but also by the dynamics of the coastal plain.[20]

The area near Tell el-Gabha was divided into four zones by Chartier-Raymond and Traunecker[21] (Figure 1): A) the dunes zone, B) the sand tongue and lagoons zone, C) the Roman Pelusiac zone and D) the Post-Pelusiac zone.[22]

A) The dunes zone

This zone, with mobile dunes and steppe vegetation, is located in the hinterland of the Flandrian transgression of the Middle Holocene. The Flandrian transgression did not flooded this area and the stark deserts there begin. Marcolongo[23] identified at least two dune systems (Figure 1). The boundary with the sand tongue and Post-Flandrian lakes zone runs from the Suez Canal at southwest to the present coast of the Gulf of Tineh at northeast, marking the maximum of the Flandrian transgression in the area (about 6000 yr B.C.)[24] (Figure 1). Sites from New Kingdom (Tell el-Borg) and Saite times (Tell el-Kedwa) occur in the dune zone, to the South and East of Lake Hebwa´s eastern section.[25]

*B) The sand tongue and lagoons zone*

This flat area is 30 km long and 6-7 km wide and was inundated by the maximum range of the Flandrian transgression. The innermost coast line of the Flandrian transgression left a small cliff of several meters over the northern plain[26] (Figure 1).

The area is occupied by two series of presently ephemeral lakes: Lake Balah near Abu Seifa and Lake Hebwa to the center. Lake Hebwa is divided into Western and Eastern sections (also named Western and Eastern Lagoons).[27] Lakes bottom is about 1m below sea level[28]. Rains fill their basins occasionally today.

A sandy spit 200-500 m wide (the sand tongue), is located northwest of the paleolakes. Chartier-Raymond and Traunecker[28] suggested that it marks a sea coastline during the Middle and Late Kingdoms. It runs from southwest to northeast from the vicinity of el-Qantara to Tell el-Mahamdiyeh, to the apex of the Gulf of Tineh.[29] The spit is covered by relatively thick beds of sand in many areas. Tell el-Ghaba occurs on this tongue (see below).

*C) The Roman Pelusiac zone*

This flat area is about 28 km long (west-east) and had a 25 km maximum width (north-south; Figure 1). The variant I of the Pelusiac branch of Nile river flowed in this area during

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of the port of Pelusium", *Geology* 27 (1999), 147.

[20] P. Fuscaldo, E. Crivelli Montero, M. V. Pereyra de Fidanza and A. Zingarelli, "A Preliminary Report on the Three Campaigns of the Argentine Archaeological Mission at Tell el-Ghaba, North Sinai, Egypt, 1995-1997 (Excavations and Study Seasons)", *REE* 6-7 (1996-1997 (2005)), 7-56.

[21] M. Chartier-Raymond and C. Traunecker, "Reconnaissance archéologique à la pointe orientale du Delta du Nil", *CRIPEL* 15 (1993), 45.

[22] See also Marcolongo, *CRIPEL* 14 ; Hoffmeier and M. `Abd el-Maksoud, *JEA* 89, 169.

[23] *CRIPEL* 14.

[24] Marcolongo, *CRIPEL* 14; D. J. Stanley and A. G. Warne, "Sea level and initiation of Predynastic culture in the Nile Delta", *Nature* 363 (1993), 435; Hoffmeier and `Abd el-Maksoud, *JEA* 89, 169.

[25] Hoffmeier and M. `Abd el-Maksoud, *JEA* 89, 169.

[26] Marcolongo, *CRIPEL* 14.

[27] D. Valbelle, F. Le Saout, M. Chartier-Raymond, M. `Abd el-Samie, C. Traunecker, G. Wagner, J.-Y. Carrez-Maratray, and P. Zignani, "Reconnaissance archéologique et géomorphologique à la pointe orientale du Delta. Rapport préliminaire sur les saisons 1990 et 1991", *CRIPEL* 14 (1992), 11; Fuscaldo, 1997.

[28] Chartier-Raymond and Traunecker, *CRIPEL* 15.

[29] Fuscaldo et al., *REE* 6-7, 7-56; Hoffmeier and `Abd el-Maksoud, *JEA* 89.

Roman times.[30] No ancient sites were reported in the zone, all findings appear to correspond to Roman or earlier times (Tell el-Luly, western Tell el-Fadda, Pelusium).[31] It was probably not hospitable for permanent settlements during the Saite period. Their northern boundary is an ancient seacoast line that passes by the medieval site Qal´at et-Tina, the line 3 of Marcolongo.[32] Presently it is a very flat and low marshy area covered with salty concretions with some areas under sea level.[33]

*D) The Post-Pelusiac zone*

This strand plain occupies the northern part of the region reaching the present seacoast. According to Goodfriend and Stanley,[34] it formed by rapid accretion in a short period during the IX century A.D. when the Pelusiac branch was blocked. Only Medieval sites were reported from this area.

**Tell el-Ghaba location**

Tell el-Ghaba is on an ancient sandy island or coastal ridge besides a flat low zone to the north (the Roman Pelusiac zone) and the eastern section of Lake Hebwa to the East, South and West (30° 58' N, 32° 25' E). The site is located between the archaeological sites Tell el-Hebwa I and II to the West and Tell el-Kedwa to the East.[35] It rises 1.2-1.5 m above surrounding terrene.[36]

Active sand dunes are more elevated in the western and northern part of the site, whilst there is a chain of lower dunes in the East, along the margin of the lake. Several sand dunes, up to 4 m higher than the surrounding ground and fixed by bushes, strongly suggest that deflation has been very active. Tell el-Ghaba is sparsely covered by tamarisks and other bushes, as its modern Arabic name testifies.[37]

Several levels and buildings were identified. At the beginning of the occupation of the site, the levels I and possibly II,[38] the site was low and was probably inundated during the flooding season. The occupation had to be seasonal and there are not permanent buildings. This situation changed later, probably because the site was elevated by sedimentation related to human activities. Important buildings were erected then.

**Environment during the Saite period**

In Dynastic times, the northwestern part of Sinai was much more hospitable for men due to the presence of eastern Nile river distributaries and the area constituted the northeastern section of the Nile Delta.[39] The Delta (Lower Egypt) has been and is the most fertile area in the country. Mediterranean winter rains and the proliferation of Delta branches permitted enough humidity as to raise cattle and crop grains.[40] Occupation of the Delta began in Pre-dynastic times, it extended their boundaries during the Middle Kingdom and it was not

[30] Marcolongo, *CRIPEL* 14.
[31] Marcolongo, *CRIPEL* 14; Valbelle et ali., *CRIPEL* 14.
[32] *CRIPEL* 14.
[33] Chartier-Raymond and Traunecker, *CRIPEL* 15, 63.
[34] Goodfriend and Stanley, *Geology* 27.
[35] Fuscaldo et al., *REE* 6-7, 7-56.
[36] Chartier-Raymond and Traunecker, *CRIPEL* 15.
[37] Fuscaldo et al., *REE* 6-7, 7-56.
[38] Fuscaldo et al., *REE* 6-7, 7-56.
[39] Bietak, *Tell el-Dab´a II*; Chartier-Raymond and Traunecker, *CRIPEL* 15; Goodfriend and Stanley, *Geology* 27.
[40] P. Fuscaldo, "Tell el-Ghaba: Tres campañas de rescate arqueológico en Egipto", *Ciencia e Investigación,* vol. 11, No. 1-2 (1997), 31.

until the Hellenistic period that reached the Mediterranean coast.[41]

Before the IX century A.D., the Pelusiac branch was the outermost section of the Nile Delta.[42] Moreover, Strabo (63 BC - 21 AD)[43] mentioned that the Canopic and Pelusiac branches were the most important in the Delta at this time, and Bietak[44] consider that there are evidences that the variant I of the Pelusiac branch was as important during certain time as the Damietta or Rosetta branches today.

During the New Kingdom, south of Tell el-Hebwa I was either a narrow lagoon or a branch of the Pelusiac, and the eastern lake (or lagoon) was most probably an estuary of that branch. No additional New Kingdom sites have been identified until now on the coastal ridge east of Tell el-Hebwa I, most likely because the coastal ridge was punctuated with wide openings that allowed water to pass back and forth between the Mediterranean and the lagoon.[45] In the area of Tell el-Ghaba, the ridge was not very high before Saite time (see above).

During Roman times, the seacoast was more to the North and the Pelusiac branch flowed into the North of the ridge. It was identified by means of sand tongues in an environment of fine grained sediments. Marcolongo[46] depicted the variant I of the Pelusiac branch at some distance to the West and North of Tell el-Ghaba (about 10 km), after making a northward turn before reaching the height of Tell el-Ghaba (Figure 1).

There are no geological data as to determine where the Pelusiac branch flowed during Saite time. Two hypothesis could be devised:

1) The Pelusiac branch flowed to the South of Tell el-Ghaba, and the sea coast was close to the ridge.

2) The Pelusiac branch flowed to the North of Tell el-Ghaba and the sea coast was several kilometers to the North. A lagoon in connection with the sea could have occurred to the North of site however. The Eastern lake would have received abundant freshwater during the annual flooding. Salinity in the northern area should have been highly variable.

We favour the second hypothesis because most of the fishes were continental. Most marine fishes could be in a lagoon connected with the sea. A few should have been fished in the sea (e.g. sharks, sea turtle; see below).

Consequently, in Tell el-Ghaba, during the VII BC, the environment was radically different to the present desertic landscape where there are no permanent streams.[47] However, the desert and the sea were very close and the environment probably had some peculiarities in comparison with other sites in Egypt.

During the occupation of the site there was availability of freshwater. The few records available from the period 500 BC to 600 AD indicate that the Nile was high.[48] Available evidence suggest that after a period of dry climate, a phase of higher rain fold stretched from 13th Dynasty to the Persian Period[49] (from 1800/1750 to 525 BC). The area surely participated of the annual flooding, refilling the nearby Eastern lagoon and probably all the area around Tell el-Ghaba. During the flood, Tell el-Ghaba would be surrounded by water as was mentioned for Pelusium.[50] According to Brewer and Friedman,[51] the flood waters would reach

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[41] Fuscaldo, *Ciencia e Investigación,* vol. 11, No. 1-2 , 31.

[42] Said, *The River Nile. Geology, Hydrology and Utilization*; Goodfriend and Stanley, *Geology* 27.

[43] Fide Bietak, *Tell el-Dab´a II.*

[44] Bietak, *Tell el-Dab´a II,* 10.

[45] Hoffmeier and M. `Abd el-Maksoud, *JEA* 89, 169.

[46] *CRIPEL* 14.

[47] Abu, *Landforms of Egypt*; Greenwood, *The Sinai. A Physical Geography*.

[48] Said, *The River Nile. Geology, Hydrology and Utilization.*

[49] P. Germond and J. Livet, *An Egyptian Bestiary* (London, 2001).

[50] Chartier-Raymond and Traunecker, *CRIPEL* 15.

the Delta by the second half of September. By late November all but the lowest basin hollows in the northernmost parts of the valley were drained. There probably was water all year around in the nearby lakes but surely there were fluctuations. Besides, the Eastern lagoon and other ponds probably had abundant vegetation and were eutrophicated during the low waters period. During periods of draught, salinity could increase and marine fauna could be nearer. Actually, in the site there is the most important rate of marine fishes in Pharaonic Egypt and the most abundant freshwater species are especially tolerant to salty water (see discussion about marine fishes below).

## Fish taxa

OSTEICHTHYES
Order Characiformes
Family Characidae
*Hydrocynus* sp.
**Common names.** Arabic name: kelb el-bahr. English name: tiger fish.

**Systematic comments**

Extremely rare in the site. Two jaws with large predacious tooth bases correspond to a species of genus *Hydrocynus* (in L1025 and L1965). This kind of teeth separates the specimen from *Alestes*, another characid fish occurring in Egypt.[52] The genus *Hycrocynus* is characterized by a scaleless head, sharply edged teeth, elongated snout and body, rounded belly, a small adipose fin, and nostrils that are close together and near the eyes.[53] The three species of *Hydrocynus* found in the Nile cannot be separated by characters bear by the remains of Tell el-Ghaba.

**Size:** *Hydrocynus vittatus* ranges in length and weight to almost 105 cm and 28 kg.[54]

**Habitat and distribution**

Family Characidae is a freshwater taxon present in Africa and South America. Many of the African species have strong teeth, especially the species of genus *Hydrocynus*. *Hydrocynus* species resemble those of genus *Alestes* but present teeth modified toward predation.[55] They have acquired strong, acute, uniserial canine teeth, those of the upper jaw alternating with those of the lower and acting as a trap. This makes the tiger fishes some of the most formidable fish-killers of African waters.[56] Strict freshwater inhabitant, *Hydrocynus* occurs in near inshore waters and in well-oxygenated offshore waters down to a considerable depth.[57] It is most often recovered during the annual flood.[58]

Order Siluriformes
Family Clariidae
*Clarias/Heterobranchus*
**Common names.** Arabic names: armoot, garmoot, karmoot. English name: catfish[59]. Spanish

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[51] D.J. Brewer and R.F. Friedman, *Fish and Fishing in Ancient Egypt* (Warminster, 1989).
[52] In L1025 and L1965.
[53] Brewer and Friedman, *Fish and Fishing in Ancient Egypt*, 54.
[54] Brewer and Friedman, *Fish and Fishing in Ancient Egypt* ; Fishbase (www.fishbase.org, active in 2004).
[55] J. Géry, *Characoids of the world* (New York, 1977).
[56] Géry, *Characoids of the world.*
[57] Fishbase.
[58] Brewer and Friedman, *Fish and Fishing in Ancient Egypt.*
[59] Brewer and Friedman, *Fish and Fishing in Ancient Egypt*.

name: bagre, pez gato. German name: Rauwelse.

**Systematic comments**

The African and Asiatic family Clariidae is represented in Egypt by two genera, *Clarias* and *Heterobranchus* each represented by two species[60] (Figure 2). The systematics of these taxa need to be revised, however.[61] Both *Clarias* and *Heterobranchus* present an elongated body and several whiskers, which was well worked out on the Pharaonic relieves and paintings in temples and tombs. They are easily separated by the presence or absence of an adipose fin.

However, skeletons of both genera are very similar and there are some difficulties to identify both genera by means of isolated bones.[62] Many fragmentary bones could be assigned both to *Clarias* and to *Heterobranchus*. However, we did not succeed in finding any clearly diagnosable remain of *Heterobranchus*, e.g. the diagnostic pectoral spines or palatine and articular,[63] in Tell el-Ghaba. For this, we suspect that no representant of this late genus is present in the samples. Actually, *Clarias* is the most common food fish on most archaeological sites in the Nile Valley, at least since the Late Palaeolithic.[64] The two species of Nile *Clarias* are best separated on the basis of soft characters that are not preserved. Supposedly, *C. anguillaris* would possess a slightly coarser granulated pattern than does *C. gariepinus* (= *C. lazera*) (Figure 2) and would be differences in the sphenotic. However, these characters are variable.[65] Von den Driesch[66] comments that the shape of vomerine tooth plate can differentiate both species. The rate between width and length would be less than 1 or 1:1 in the former and more than 1 in *C. gariepinnus*. Vomerine plates present in the sample resemble those of *C. gariepinus*. However, we prefer to be conservative and leave the identification to the level of *Clarias/Heterobranchus*.

**Size.** Clariids are relatively large fishes: *Heterobranchus longifilis* is reported to 150 cm SL, maximum weight: 55 kg; *Heterobranchus bidorsalis* to 150 cm SL, maximum weight: 30 kg. *Clarias gariepinus* to 150 cm SL, maximum weight: 60 kg; *Clarias anguillaris* to 100 cm SL, maximum weight: 7 kg.[67]

**Habitat and distribution**

Family Clariidae is distributed in the whole Nile system, other parts of Africa and southeast Asia.[68] It is a strict shallow freshwater inhabitant (Figure 3).

The hardiness of *Clarias* is legendary among the fishermen and villagers of Egypt. *Clarias* prefers shallow deoxygenated waters. They have also been recovered from relatively

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[60] G. G. Teugels, "Clariidae" in J. Daget, J.-P. Goose and D. F. E. Thys van den Ausenaerde (eds.), *Check-list of the freshwater fishes of Africa* (ISNB, MRAC, ORSTOM; Paris, 1986), 66-101; Brewer and Friedman, *Fish and Fishing in Ancient Egypt*.

[61] Brewer and Friedman, *Fish and Fishing in Ancient Egypt.*

[62] A. von den Driesch, "Fische im alten Ägypten - eine osteoarchäologische Untersuchung", *Documenta Naturae* 34 (1986), 1.

[63] P. H. Greenwood and E. Todd, "Fish remains from Upper Paleolithic sites near Idfu and Isna", in F. Wendorf and R. Schild (eds.), *The Prehistory of Nubia* (Academic Press, New York, 1976), 383-8; von den Driesch, *Documenta Naturae* 34; M. Gayet and W. van Neer, "Caractères diagnostiques des épines de quelques silures africains", *Journal of African Zoology* 239 (1990), 152 ; Wheeler and Jones, *Fishes.*

[64] W. van Neer and A. M. H. Ervynck, "The faunal remains," in S. E. Sidebotham and W. Z. Wendrich (eds.), *Berenike 1997* (Research School of Asian, African and Amerindian Studies, Leiden, 1999), 325-349.

[65] Brewer and Friedman, *Fish and Fishing in Ancient Egypt.*

[66] von den Driesch, *Documenta Naturae* 34.

[67] Fishbase.

[68] J. Daget, J.-P.Goose and D. F. E. Thys van den Ausenaerde (eds.), *Check-list of the freshwater fishes of Africa;* J. S. Nelson, *Fishes of the World* (New York, 1994).

deep waters with a muddy bottom. The ability of *Clarias* to survive in stagnant water is due to an elaborate accessory breathing organ that enables these fish to use atmospheric oxygen.[69] Even though its gill filaments are well developed, it appears that *Clarias* is dependent on the additional supply of oxygen for survival.[70]

*Heterobranchus* is believed to be a bottom feeder and thought to possess the amphibious-like qualities of *Clarias*. Although *Clarias* has been recovered from deep waters by trammel and sinking gill nests, Worthington also recovered *Heterobranchus* from the turbulent water below the Murchinson Falls. It may be that *Heterobranchus* prefers waters with some current vis-à-vis *Clarias*, which thrives in the more stagnant waters of lacustrine and riverine environments.[71]

*Clarias gariepinus* is a bottom feeder, which occasionally feeds at the surface.[72]

Species of *Clarias* "can be collected by hand, particularly during the spawning season (...). Evidence appears to indicate that *Clarias* may be an opportunistic breeder. Spawning has been triggered in some *Clarias* species by artificially raising the water level of the lakes in which they live".[73] Their meat is not very good.[74]

Family Mochokidae

*Synodontis schall*

**Common names.** Arabic name: schall, gargoor. English name: catfish.[75] German name: Fiederbartwelse.[76] Spanish names: bagre, pez gato.

**Systematic comments**

A cephalo-nuchal shield, which joins the skull bones with the interneural bones, is characteristic of the family. *Synodontis* is the only genus of this family that is common in Egypt[77] (Figure 2). The strong cranial and pectoral bones and finspines are typical of the genus and distinguishable from clariids and other families (Figures 2, 4).

There are very few postcranial bones of *Synodontis* in Tell el-Ghaba. There are many cleithra, dorsal and pectoral spines and other bones, however (see discussion below in **Preparation of fishes**). The material is here assigned to *Synodontis schall* especially for the shape of the poshumeral process which is pointed, triangular, large, with the lower side straight and the upper caudal side slightly concave (Figures 2,4). It clearly differs from *S. membranaceous, S. batensoda, S. acanthomias*, *S. serratus*, *S. frontosus*, *S. sorex.*[78] Neither posthumeral processes nor other identificable bones of another species of genus *Synodontis* were found in the site.

**Size:** 430 cm SL.[79]

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[69] Brewer and Friedman, *Fish and Fishing in Ancient Egypt,* 60.

[70] Brewer and Friedman, *Fish and Fishing in Ancient Egypt,* 60.

[71] Brewer and Friedman, *Fish and Fishing in Ancient Egypt,* 63.

[72] Fishbase.

[73] Brewer and Friedman, *Fish and Fishing in Ancient Egypt,* 61.

[74] J. Boessneck and A. von den Driesch, *Tell El-Dab´A VII. Tiere und historische Umwelt im Nordost-Delta im 2. Jahrtausend v. chr. anhand der Knochenfunde der Ausgrabungen 1975-1986*. Fische (Wien, 1992), 42-48.

[75] Brewer and Friedman, *Fish and Fishing in Ancient Egypt.*

[76] von den Driesch, *Documenta Naturae* 34.

[77] Brewer and Friedman, *Fish and Fishing in Ancient Egypt.*

[78] L. Taverne and T. Aloulu, "Étude anatomique, myologique, et ostéologique du genre *Synodontis*, Cuvier (Pisces, Siluriformes, Mockokidae)", *Annales du Musée Royal de l'Afrique Centrale, Zoologie* 210 (1974), 1 ; von den Driesch, *Documenta Naturae* 34.

[79] J.-P. Goose, "Mochokidae", in J. Daget, J.-P.Goose and D. F. E. Thys van den Ausenaerde (eds.), *Check-list of the freshwater fishes of Africa* (ISNB, MRAC, ORSTOM; Paris, 1986), 105-52.

**Habitat and distribution**

Mochokidae is a typical African freshwater family.[80] Habitat preferences of *Synodontis* vary according to species. Most species prefer deep waters, although they are recovered from inshore areas as well. Nile fishermen in Cairo, el-Minya, and Luxor report catching more *Synodontis* in offshore fishing forays vis-à-vis fishing near to shore. Near-shore catches seldom produce *Synodontis*[81] (Figure 3). *Synodontis schall* is omnivorous, including molluscs. It is night active, usually in large schools, in slowly flowing waters or lagoons. It is common in the whole Nile system.[82]

The serrated spines offer a formidable defense and can inflict painful wounds. Nile fishermen are aware of the dangers these spines can pose and sometimes use wire cutters to remove the dorsal and pectoral spines before taking these fish from the nets. The ancient Egyptian fishermen were also aware of the danger the spines could pose and took similar precautions in their removal as it has been depicted in Egyptian art.[83]

Family Bagridae
*Bagrus* sp.
**Common names.** Arabic name: bayad, dormac. English name: catfish.[84] Spanish name: bagre, pez gato. German name: Stachelwelse.[85]

**Comments:** extremely rare in the site. Found in L0001.

**Size:** *Bagrus bajad*, 72 cm SL; maximum weight: 5.9 kg.[86]

**Habitat and distribution**

Freshwater family of Africa and Asia.[87] It is a strict freshwater inhabitant. Egyptian fishermen working the Nile for *Bagrus* generally fish in the deeper waters where some current can be detected. In Lake Nasser, however, *B. bajad* can be caught in shallow water with rocky bottoms. From this information and from personal observations it seems that the genus may prefer water possessing some current rather than simply shallow or deep water.[88]

Order Perciformes
Family Centropomidae
*Lates niloticus*
**Common names.** Arabic names: isher bayad, samoos, laffash.[89] English name: nilotic perch. Spanish name: perca nilótica. German name: Nilbarsch.[90]

[80] Nelson, *Fishes of the World.*
[81] Brewer and Friedman, *Fish and Fishing in Ancient Egypt,* 67.
[82] von den Driesch, *Documenta Naturae* 34.
[83] Brewer and Friedman, *Fish and Fishing in Ancient Egypt,* 67.
[84] Brewer and Friedman, *Fish and Fishing in Ancient Egypt.*
[85] Boessneck and A. von den Driesch, *Tell El-Dab´A VII.*
[86] Fishbase.
[87] Nelson, *Fishes of the World.*
[88] Brewer and Friedman, *Fish and Fishing in Ancient Egypt,* 66.
[89] Brewer and Friedman, *Fish and Fishing in Ancient Egypt.*
[90] von den Driesch, *Documenta Naturae* 34.

**Systematic comments**

Most bones of *Lates niloticus* are strong and easily identifiable.[91] The cleithrum is especially typical. However, we only found two bones referable to cleithrum.

All perciform spines were small and were assigned to *Oreochromis* here. Supposedly, most spines and all branched rays of *Lates* are not certainly distinguishable from those of *Oreochromis*.[92] However, besides the size, there are differences in the anal spine. We did not find any spine assignable to *Lates*.

**Size:** *Lates niloticus* is the largest fish freshwater in the region: 190 cm SL, maximum weight: 200 kg.[93]

**Habitat and distribution**

The family is marine and brackish in the Atlantic, Indian and Pacific Oceans, and freshwater, especially in Africa.[94] *Lates niloticus* is a freshwater species of the Ethiopian region but also occurs in brackish waters in Lake Mariout, near Alexandria; it inhabits channels, lakes, and irrigation canals.[95] Adults inhabit deep water, while juveniles are found in shallow water.[96]

Brewer and Friedman[97] suggest that *Lates niloticus* is relatively abundant in the south of Egypt and *Oreochromis* in the north.

Family Mugilidae

*Mugil* sp.

**Common names.** Arabic names: bourie, tobar, garan.[98] English name: mullet, grey mullet. Spanish name: lisa, liza. German name: Meeräschen.[99]

**Systematic comments**

Three genera of mugilids are found in the area. *Liza*, *Mugil* y *Chelon.*[100] *Mugil* is represented in the Mediterranean coast of Egypt by three species (*M. cephalus*, *M. capito*, and *M. auratus*), all of which enter the Nile and have been found far up-river.[101] Authors do not distinguish the different species with bones.

**Habitat and distribution**

Mullets inhabit coastal marine and brackish water in tropical and temperate oceans.[102] As a family, the mullets are essentially shore fishes, but they have a preference for the mouths of rivers and cutoff lakes were the water is brackish.[103] Individuals of *Mugil* enter usually in

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[91] W. van Neer, "A study of the variability of the skeleton of *Lates niloticus* (Linnaeus, 1758) in view of the validity of *Lates maliensis* Gayet, 1983", *Cybium* 11 (1987), 411.

[92] N. Greenwood, The Sinai. A Physical Geography, 1997.

[93] Fishbase.

[94] Nelson, *Fishes of the World*.

[95] Fishbase.

[96] von den Driesch, *Documenta Naturae* 34; J. Peters, N. Pöllath, and A. von den Driesch, "Ichthyological diversity in the Holocene palaeodrainage systems of Western Nubia", *Archaeology in Sudan* (2003), 325-335; Fishbase.

[97] Brewer and Friedman, *Fish and Fishing in Ancient Egypt.*

[98] Brewer and Friedman, *Fish and Fishing in Ancient Egypt.*

[99] von den Driesch, *Documenta Naturae* 34.

[100] C. F. H. Hosny, *Fishes of the Mediterranean sea adjacent to Egypt* (http://www.fao.org/DOCREP/003/V4890E/V4890E02.htm, active in 2004).

[101] Brewer and Friedman, *Fish and Fishing in Ancient Egypt.*

[102] Nelson, *Fishes of the World*.

[103] Brewer and Friedman, *Fish and Fishing in Ancient Egypt.*

freshwater. The mullets, in commercial catches, probably exceed all other fish, with the exception of *Oreochromis*, in the Nile today.[104]

The three species of *Mugil* present in the area enter the Nile and have been found far up-river.[105] *M. aurata*, however, is rare in freshwater.[106] In the Nile, grey mullets have been reported as south as Assuan.[107]

The grey mullets are sociable and move about in large schools, thus rendering their capture easy. They can be found in all parts of Lake Mazalah but seem to frequent the deeper water and areas where water plants are abundant.[108] Not only the meat was consumed but the eggs, pressed, dried and salted, provided Egyptian gourmets with a sort of caviar.[109]

Family Cichlidae
*Oreochromis* sp.
**Common names.** Arabic name: bolti. English name: tilapia.[110] Spanish name: chanchita, tilapia. German name: Bundbarsch.[111]

**Systematic comments**

Three genera are known in the Egyptian Nile: *Hemichromis*, *Haplochromis* and *Oreochromis*. The only common genus in Egypt is *Oreochromis*. There are several species. *Oreochromis niloticus* is the most common member of the family in the Nile[112] (Figure 5).

**Size.** *Oreochromis niloticus*: 60 cm SL; 3.65 kg.[113]

**Habitat and distribution**

The family is present in South America, Africa and Asia.[114] Most of the cichlid species are freshwater inhabitant but several species of tilapias (species of *Tilapia*, *Sarothermodon*, and *Oreochromis*) are euryhaline and can disperse along some brackish coastlines between rivers.[115]

*Oreochromis niloticus* occurs today in a wide variety of freshwater habitats like rivers, lakes, sewage and irrigation canals.[116] In general, tilapias are especially fond of shallow-water areas where vegetation is abundant[117] (Figure 3). Nile fishermen in Cairo, el-Minya, and Luxor report cichlids predominate in near-shore catches in these locations.[118]

Family Sparidae
**Common names.** English name: porgy. Spanish name: besugo.

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[104] Brewer and Friedman, *Fish and Fishing in Ancient Egypt.*
[105] Brewer and Friedman, *Fish and Fishing in Ancient Egypt.*
[106] Fishbase.
[107] Brewer and Friedman, *Fish and Fishing in Ancient Egypt.*
[108] Brewer and Friedman, *Fish and Fishing in Ancient Egypt.*
[109] Germond and Livet, *An Egyptian Bestiary.*
[110] Brewer and Friedman, *Fish and Fishing in Ancient Egypt.*
[111] Boessneck and A. von den Driesch, *Tell El-Dab´A VII.*
[112] von den Driesch, Documenta Naturae 34; Brewer and Friedman, *Fish and Fishing in Ancient Egypt*.
[113] Fishbase.
[114] Nelson, *Fishes of the World*.
[115] Nelson, *Fishes of the World*.
[116] Fishbase.
[117] Peters et alli, *Archaeology in Sudan*, 325-35.
[118] Brewer and Friedman, *Fish and Fishing in Ancient Egypt,* 67.

*Sparus auratus*
**Systematic comments:** this species was identified in ancient Egypt sites[119] and Israel[120] (Figures 5, 6). Specimens of large size present a huge molariform in the rear of dentary and premaxilla[121] (Figure 6).

**Size:** attains 70 cm and 17.2 kg.[122]
**Habitat and distribution**
A marine (very rarely brackish and freshwater) family in the Atlantic, Indian and Pacific.[123] Common in the Mediterranean. *Sparus auratus* lives on small animals with shells, which also occurs in the brackish water; e.g. Lake Manzalah.[124]

Family Sciaenidae
*Argyrosomus regius*
**Common names.** English name: drums, croackers. Spanish name: corvina.

**Systematic comments**
There are only three sciaenid genera and species in the Mediterranean: *Sciaena umbra* (= *Corvina nigra*[125]), *Umbrina cirrosa* (*o cirrhosa*[126]) and *Argyrosomus regius (Johnius hololepidotus* = *Sciaena aquila*[127] (Figure 6).
The otoliths, dentaries and premaxilla closely resemble those of *Argyrosomus regius* and differ from those of *Sciaena* and *Umbrina*. Some authors cited the presence of *Johnius hololepidotus*, actually a synonym of *Argyrosomus*. Both otoliths described for "*Johnius holoepidotus*",[128] and the material from Sinai clearly differ from those of the species of genus *Johnius*.[129]

**Size:** attaining 230.0 cm TL (male/unsexed); max.weight: 103 kg.[130]

**Habitat and distribution**
Family Sciaenidae is an important family of nerithic marine fishes with representants in brackish and freshwater.[131]
*Argyrosomus regius* presently occurs both in the Mediterranean and the Red Sea, but migrated to this latter via the Suez Canal. The species inhabit inshore and shelf waters, close to bottom as well as in surface and midwaters, pursuing shoals of clupeids and mugilids. Specimens congregate inshore to spawn during spring and summer. Juveniles and subadults enter estuaries and coastal lagoons. Both adults and juveniles are migratory moving along

[119] von den Driesch, *Documenta Naturae* 34; Boessneck and A. von den Driesch, *Tell El-Dab´A VII*.
[120] O. Lernau, "Fish bones from Horbat Rosh Zayit", in Z. Gal and Y. Alexandre (eds.), *Horbat Rosh Zayit Israel* (Israel Antiquities Authority; Jerusalem, 2000), 233-7.
[121] Personal communication, S. Mariani.
[122] Fishbase.
[123] Nelson, *Fishes of the World*.
[124] von den Driesch, *Documenta Naturae* 34.
[125] W. Schwarzhans, "A comparative morphological treatise of recent and fossil otoliths of the family Sciaenidae (Perciformes)", *Piscium Catalogus* 1 (1993), 80.
[126] Schwarzhans, *Piscium Catalogus* 1, 64.
[127] Schwarzhans, *Piscium Catalogus* 1, 137.
[128] See Sasaki, *Memoirs of the Faculty of Fisheries Hokkaido University* 36.
[129] Schwarzhans, *Piscium Catalogus* 1.
[130] Fishbase.
[131] Nelson, *Fishes of the World*.

shore or offshore/onshore in response to temperature change. It feeds on fishes and swimming crustaceans.[132] It occurs in the brackish waters of Lake Manzalah.

CHONDRICHTHYES
Order Lamniformes
Family Odontaspididae
*Carcharias taurus*
**Common names.** English name: grey nurse shark, sand tiger shark. Spanish name: escalandrún, tiburón tigre.

**Systematic comments:** the material consists in one second upper anterior right tooth (Figure 7).

**Size:** attaining 318 cm TL but generally being smaller to about 300 cm; size at birth 95 to 105 cm.[133] Maximum published weight: 158.8 kg.[134]

**Habitat and distribution**

Marine, shallow water species.[135] I did not know reports in brackish or freshwater. It occurs in the Red Sea and off South Africa to Japan, Korea and Australia. Present in Arafura Sea. Western Atlantic: Gulf of Maine to Argentina. Old record from Bermuda, south Brazil.[136] Generally rare in the Mediterranean and perhaps declining. Occasional and sporadic from Gibraltar along the Spanish coasts to the Gulf of Lyons; also Balearics; Morocco, Melilla, Algeria and Tunisia along North African coasts; Western Italy (Tyrrhenian Sea, Sardinia, Elba, Ponza, and other insular sites); Sicily, Pelagie Islands and Malta; Ionian Sea coastline of Italy (Calabria); Adriatic Sea but increasingly scarce there. Greeks seas including the Aegean, but sporadic; generally insular (e.g., Cyclades, Dodecanese).[137]

It is not included in the fauna of the Mediterranean coast of Egypt[138] although it is shown in the Egyptian coast of the Red Sea.[139] However, it has been reported from Israel 50 years ago.[140]

Order Carcharhiniformes
Family Sphyrnidae
*Sphyrna* cf. *lewini*
**Common names.** English name: hammerhead shark. Spanish name: tiburón martillo.

**Comments:** only vertebrae. Some of them artificially perforated (Figure 4).

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[132] Fishbase.
[133] I. K. Fergusson, *Shark gallery* (http://shark-gallery.netfirms.com/med/sandtiger.htm, active in 2004).
[134] Fishbase.
[135] A. J. Bass, J. D'Aubrey, and N. Kistnasamy, "Sharks of the east coast of southern Africa. IV. The families Odontoaspididae, Scapanorhynchidae, Isuridae, Cetorhinidae, Alopiidae, Orectolobidae and Rhiniodontidae", *Investigational Report of the Oceanographic Research Institute* 39 (1975), 12.
[136] Fishbase; L. J. V. Compagno, "Sharks of the World. An annotated and illustrated catalogue of shark species known to date. Vol. 2. Bullhead, mackerel and carpet sharks (Heterodontiformes, Lamniformes and Orectolobiformes)" (Fao Species Catalogue for Fishery Purposes 1(2), Rome, 2001).
[137] Fergusson, *Shark gallery*.
[138] Fergusson, *Shark gallery*.
[139] Compagno, "Sharks of the World. An annotated and illustrated catalogue of shark species known to date. Vol. 2. Bullhead, mackerel and carpet sharks.
[140] Hosny, *Fishes of the Mediterranean sea adjacent to Egypt*; Daniel Golani, personal communication.

**Size:** attains 350 cm.

**Habitat and distribution:** marine. I did not find reports in brackish or freshwater. *S. lewini* appears not to occur in the eastern Mediterranean.[141]

Family Carcharhinidae
*Carcharhinus* cf. *obscurus*
**Common names.** English name: Dusky shark

**Systematic comments:** a series of 28 vertebrae found articulated, indicating that they integrated a piece of the shark.

**Size:** attains 365 cm.[142]

**Habitat and distribution:** marine. I did not find reports in brackish or freshwater. It is included in the list of fishes in the Mediterranean near Egypt.[143] Other species of *Carcharhinus* (*Carcharhinus zambezensis* and *C. leucas*) do occur in tropical Africa and other continents.[144]

Batoidea
**Common name.** English name: ray, skate. Spanish name: raya.

**Systematic comments:** only vertebrae, some of them perforated.

**Habitat and distribution**

Most are marine, but several inhabit brackish and freshwater including in tropical Africa.[145] The only large group of freshwater batoids is the South American Family Potamotrygonidae.[146] Several species in the genera *Dasyatis* and *Himantura* enter freshwater in different continents.[147] In Africa, rays were reported from the Niger basin, the Cross River, and the Congo River[148] but none was reported from the Nile.

## General features of the archeoichthyofauna at Tell el-Ghaba

We assume that all vertebrate remains are related with human activities because we did not find evidence of natural accumulations. The site was quite above the upper level of Nile floodings, at least when the mud-brick buildings were erected (Stratum III). Tell el-Ghaba was probably flooded during the deposition of Stratum I (lowest) and perhaps Stratum II.

The inhabitants of the site consumed a large quantity of fish (NISP: 87.04% of total archaeofauna). There seems to be no important variation through the successive levels. They

[141] P. R. Last and J. D. Stevens, *Sharks and rays of Australia* (Hobart, 1994).
[142] Last and Stevens, *Sharks and rays of Australia.*
[143] Hosny, *Fishes of the Mediterranean sea adjacent to Egypt.*
[144] P. Budker, *The life of sharks* (New York, Columbia University Press, 1971); T. M. Berra, *Freshwater Fish Distribution* (San Diego, 2001).
[145] Berra, *Freshwater Fish Distribution.*
[146] R. Menni, "Peces y ambientes en la Argentina continental", *Monografías del Museo Argentino de Ciencias Naturales* 5 (2004).
[147] Berra, *Freshwater Fish Distribution.*
[148] L. J. V. Compagno and T. Roberts, "Marine and freshwater stingrays (Dasyatidae) of West Africa, with description of a new species", *Proceedings of the California Academy of Sciences* 43 (1984), 283.

also ate reptiles (turtles, crocodiles), birds, and mammals (pigs) (Table 1). Many of the birds and mammals could be domestic and they also raised donkeys and dogs.

From the identified ichthyofauna, *Clarias/Heterobranchus* (51.10%) appears to be dominant in NISP, followed by *Oreochromis* sp. (28.05%), *Synodontis schall* (14.16%), and *Mugil* sp. (4.41%) (Table 2). These species constitute the 97.72% of the archaeoichthyofauna identified at or under familial level (93.12% in MNI).

There are only one species of *Synodontis* in Tell el-Ghaba contrasting with the four or five species reported from other Pharaonic sites, e.g. Elephantine and Tell el-Dab`a.[149]

No polypterids, schilbeids, cyprinids, anguilliforms, common or present in other Pharaonic sites from the Nile Delta and valley was found[150] (Table 3). Cyprinids have large pharyngeal teeth and polypterids thick paleoniscoid scales and bones that are easily preserved and identifiable.[151] The Nilotic perch, abundant in other sites, is extremely rare here.

Besides the Nilotic species, there are the largest and most diverse marine fish fauna in a Pharaonic site (NISP: 6.55%, including *Mugil* sp.), what it is certainly related with the proximity to the Mediterranean Sea. This is the only Pharaonic site where marine selachians such as *Carcharhinus obscurus*, *Sphyrna lewini*, *Carcharias taurus* (the first shark tooth from a Pharaonic site) and batoids (along with a marine turtle) are recorded. Marine fishes (including sharks) were common in Roman settlements in the Eastern Desert of Egypt.

No particular pattern of freshwater or marine fish composition was detected among the different loci, buildings and/or occupation levels.

The largest fishes are clariid catfishes and lamniform and sphyrnid sharks. Some catfish remains correspond to specimens larger than 100 cm SL and the *Carcharias taurus* tooth and a vertebra of *Sphyrna* to individuals of more than 200 cm TL. There are also some relatively large *Oreochromis* sp. and *Mugil* sp. There are no very small fishes (less than 8 cm SL). However, this could be a limitation of sampling. The rare *Lates niloticus* specimens correspond to small or medium sized fishes. Most of the fishes correspond to medium to large sized fishes.

**Taphonomy**

No evidence of natural deposition was found. There is not doubt that vertebrate remains were used by the inhabitants of the site. Most fish bones are preserved anatomically disconnected. Some loci include well preserved isolated bones (e.g. L1058). There are only two loci with numerous articulated specimens of *Oreochromis niloticus* (L1030, L1031). Several anatomically associated *Clarias/Heterobranchus* skulls were also recovered. A section of 28 articulated vertebrae of *Carcharhinus* cf. *obscurus*, which probably corresponded to a piece of dried fish, were found in L1225.

**Provenance of freshwater fishes**

The composition of the archaeoicthyofauna recovered in Tell el-Ghaba can be explained in terms of biogeography, ecological constraints and mode of fishing. Certainly, dispersal of aquatic animals such fishes and crocodiles depend upon hydrological connections and environmental conditions. Fishing methods and human preferences obviously bias the taxic representation in the sample.

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[149] von den Driesch, *Documenta Naturae* 34; Boessneck and A. von den Driesch, *Tell El-Dab´A VII*.

[150] von den Driesch, *Documenta Naturae* 34.

[151] J. P. Lehman, "Brachiopterygii", in P. Grassé (ed.), *Traité de Zoologie* (Masson, Paris, 1966), 414-20 ; M. Gayet, F. Meunier and V. Levrat-Calviac, "Mise en évidence de plus anciens Polypteridae dans le gisement sénonien d'In Beceten (Niger)", *Comptes Rendus de la Academie des Sciences, Paris* 307 (1988), 205; M. Gayet and F. Meunier, "Nouveaux polypteriformes du gisement coniacien-sénonien d'In Becetem (Niger)", *Comptes Rendus de la Academie des Sciences, Paris* 322 (1996), 701.

Most abundant fishes in Tell el-Ghaba are *Clarias/Heterobranchus*, followed by *Oreochromis* sp., *Synodontis schall*, and *Mugil* sp. These taxa are the 97.72% (NISP) of the identified archaeoichthyofauna (Table 2). Ancient Egyptians especially appreciated *Lates niloticus*, *Oreochromis niloticus* and *Mugil cephalus.*[152] Brewer and Friedman[153] suggested that *Lates niloticus* is relatively abundant in the south of the Egyptian Nile basin and *Oreochromis* in the north. In Tell el-Ghaba, *Oreochromis* is abundant but *L. niloticus* is extremely rare. In other deltaic sites such Tell el-Dab`a, Minshat Abu Omar, and Merimde-Benisalâme there is a moderate record of *Lates niloticus.*[154] *Lates niloticus* are large and medium sized and include strong bones, easily preserved and identifiable. They inhabit open and well oxygenated waters, which were not present near Tell el-Ghaba. Occasionally, a local interdict would have prevented the inhabitants of a particular district or town from eating a named species.[155] During the Late Period, *Lates niloticus* was associated with the goddess Neith, which was a warrior one, mother of the sun at Sais, assimilated with Athena by the Greeks.[156] In this context, the people of Esna (Latopolis), in Upper Egypt, were forbidden to eat the Nile perch. None of these sites with abundance of *Lates niloticus* mentioned above correspond to the Late Period. Consequently, their extreme rarity in Tell el-Ghaba could be related to absence of suitable environments but it could not discarded that it would be related to a taboo. I discard that the absence or rareness of other stenoic freshwater fishes such as cyprinids, *Bagrus* spp., and polypterids, could be related to some taboo (see below).

The four taxa that dominate in Tell el-Ghaba are especially tolerant to extreme conditions. *Clarias gariepinus* (and the other clariids), *Synodontis schall* (differing from other *Synodontis* species) and tilapiines can stand waters with poor oxygen content and increased salinity.[157] Clariids and tilapiines are common in vegetated shallow areas where temperature can fluctuate. Species of *Mugil* are amphibiotic worldwide. On the contrary, *Lates niloticus*, bagrids and mormyrids, which are extremely rare or absent in the site, prefer well-oxygenated waters[158] (Figure 3).

The area that surrounded Tell el-Ghaba was apparently covered by shallow lakes, swamps and (probably seasonally salty) marshes. During the lowstand of the Nile, only those fishes than can cope with non favorable environmental conditions and shallow water would be abundant.

Lernau[159] has suggested that *Lates niloticus* could have inhabited streams in Israel. Lernau, based his hypothesis on their widespread distribution in Israel, the wide range of estimated sizes (up to 140 cm SL) and the dating of these remains to a wide range of periods, from the Chalcolithic to the Early Islamic. Another view mantains that, as the fish has been appreciated from old times, it could have been introduced into Israel from the Nile salted or dried.

**Provenance of marine fish and turtles**

Marine and brackish fishes are 1.35% of the total catch (4.39% if *Mugil* sp., a common amphibiotic taxon). In other localities from Pharaonic times with marine species, Tell el-Dab`a includes 0.25% (1.25%), Minshat Abu Omar 0.37% (0.85%), and Tell el-Maskhuta

[152] Germond and Livet, *An Egyptian Bestiary.*
[153] Brewer and Friedman, *Fish and Fishing in Ancient Egypt.*
[154] von den Driesch, *Documenta Naturae* 34.
[155] Germond and Livet, *An Egyptian Bestiary.*
[156] Brewer and Friedman, *Fish and Fishing in Ancient Egypt*; Germond and Livet, *An Egyptian Bestiary.*
[157] Peters et ali, *Archaeology in Sudan*, 325-35.
[158] Peters et ali, *Archaeology in Sudan*, 325-35.
[159] "Fish bones from Horbat Rosh Zayit".

0.02% (0.19%).[160] Sharks (actually, only one vertebra) were described for the first time for a Pharaonic site at Tell el-Dab`a[161] and now in Tell el-Ghaba. Two vertebrae have been used as ornaments. A tooth of *C. taurus* appears unmodified. Batoids are described for the first time in an archaeological Egyptian site. One vertebra has been used as an ornament. Sparids and *Argyrosomus regius* are marine taxa that also occur in brackish waters and *Mugil* spp. enters freshwater (all they occur at Tell el-Dab`a;[162] sparids and *Argyrosomus regius* are very rare there, however). Sparids, *Argyrosomus regius* and *Mugil* spp. use coastal lagoons as spawning areas e.g. Lake Bardawil.[163]

There are some references of elasmobranchs from freshwater environments in tropical Africa as in other continents.[164] Freshwater batoids (stingrays and pristids) in Senegal or *Carcharhinus zambezensis* and *C. leucas* in Gambia and Gabon.[165] However, I do not know any report about the presence of rays or sharks in the Nile. *Carcharias taurus*, *Sphyrna lewini,* and *Carcharhinus obscurus* are not known in brackish or freshwater.[166]

Three different origins for the marine fishes in the site can be proposed: 1) fishing in the area by the inhabitants of Tell el-Ghaba (a, in the Pelusiac branch; b, in a nearby brackish or salty lagoon); 2) fishing in the marine coast by the inhabitants of Tell el-Ghaba; 3) trade from the coast or from a distant country (e.g. Judah, Israel).

1a) implies that the Pelusiac branch, especially during Nile lowstand periods, could present brackish or salty water. However, the mouth appears to have been many kilometers from Tell el-Ghaba. Quite probably there was some marine influence in the river or lagoons and this can explain the larger proportion of sciaenids and sparids. However, it does not explain sharks and rays.

1b) implies that the low area located to the North was occupied by a coastal lagoon, perhaps similar to Lake Manzalah.

2) implies that inhabitants sailed to the sea or to the mouth of the Pelusiac branch for fishing. This appears to be unlikely, especially taking into account the large quantity of fish that surely existed in the area.

3) appears to be more probable for sharks and turtles. Certainly there was a trade with other areas.[167] Besides, it has demonstrated in other areas that marine fishes were trade inland.[168] Egyptians brought from abroad timber, iron, silver, tin, lead,[169] and fish were used by Egyptians as payment in international trade.[170] During the Saite period, there was import of goods from Levant, as it is evidenced by foreign pottery. Egyptians exported fish.[171] However, it appears unlikely that the inhabitants of the site would import fish for food from outside. Actually, we do not know any evidence of foreign fishes in Egypt in Dynastic times

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160 von den Driesch, *Documenta Naturae* 34.

161 Boessneck and A. von den Driesch, *Tell El-Dab´A VII*; von den Driesch, *Documenta Naturae* 34.

162 Boessneck and A. von den Driesch, *Tell El-Dab´A VII*.

163 T. Jones (comp.), *A Directory of Wetlands of International Importance*.

164 A. L. Cione, M. Azpelicueta, M. Bond, A. Carlini, J. Casciotta, M.A. Cozzuol, M.d.l. Fuente, Z. Gasparini, F. Goin, J. Noriega, G.J. Scillato-Yané, L. Soibelzon, E. Tonni, D. Verzi, and M.G. Vucetich, "Miocene vertebrates from Entre Ríos province, Argentina", *Serie de Correlación Geológica* 14 (2000), 191 ; Berra, *Freshwater Fish Distribution.*

165 Budker, *The life of sharks*; Berra, *Freshwater Fish Distribution.*

166 Berra, *Freshwater Fish Distribution*.

167 Brewer and Friedman, *Fish and Fishing in Ancient Egypt.*

168 See Lernau, "Fish bones from Horbat Rosh Zayit".

169 D. B. Redford, "Egypt and the world beyond", in D. P. Silverman (ed.), *Ancient Egypt* (Oxford University Press; New York, 1997), 40-56.

170 M. Lichtheim, *Ancient Egyptian Literature. A Book of Readings II: The New Kingdom,* (Berkeley, 1976 (fide Brewer and Friedman, *Fish and Fishing in Ancient Egypt*).

171 Germond and Livet, *An Egyptian Bestiary.*

excepting for the representation of fishes from Pwnt in the Hapshetswt temple at Deir el-Bahari (see below). However, some especial remains such as shark and ray vertebrae, a shark tooth and perhaps turtle remains could be brought as curiosities or for stuff for adornments. Actually, several vertebrae are perforated to serve as beads (Inv. No. F0839A from L0232;[172] Inv. No. F0927A from L1230;[173] Inv. No. F0920A from L1058[174]). Also, they could have been trade with fishermen of the seacoast.

The occurrence of a taxon that do not occur in the eastern Mediterranean such as *Sphyrna lewini*[175] or in Mediterranean Egyptian coasts such as *Carcharias taurus*[176] could be related to a change in the distribution or to trade. Both inhabit the Red Sea today.

**Comparison with other sites**

Tell el-Ghaba was located near the Pelusiac branch, the easternmost section of the Delta.[177] For this, notwithstanding its singularity, Tell el-Ghaba shares some faunistic features with other sites located in the Delta. Tell el-Dab`a/Avaris is a 2nd Millennium site which is also located upstream in the Pelusiac branch.[178] Faunal remains have been well described there.

Tell el-Ghaba fish composition is similar to that of Tell el-Dab`a in the remarkable abundance of *Clarias/Heterobranchus* and the presence of *Oreochromis,* Sparidae*, Mugil, Lates niloticus, Synodontis schall*, and *Bagrus* (record of Tell el-Dab`a according to Boessneck and von den Driesch). However, the fish record of Tell el-Ghaba differs from that of Tell el-Dab`a in that *Oreochromis, Mugil, Synodontis* and *Sparidae* are much more abundant, especially the three first taxa; *Lates niloticus* is extremely rare; no *Polypterus bichir, Barbus bynni* nor *Schilbe mystus* or *Schilbe uranoscopus* were identified; and in the presence of typical marine fishes such as Batoidei, *Carcharhinus* cf. *obscurus*, *Sphyrna* cf. *lewini*, and *Carcharias taurus* (and marine turtles).

There are only one species of *Synodontis* in Tell el-Ghaba contrasting with the four or five species reported in other sites, e.g. Elephantine and Tell el-Dab`a.[179]

Marine fishes occur in other deltaic sites but not in Upper Egypt. In Tell el-Ghaba, we recorded the teleosts Sparidae (NISP: 1.19 %), *Argyrosomus regius* (0.31%), and *Mugil* sp. (4.41%; *Mugil* spp. are amphibiotic and behave as freshwater fish, penetrating deeply in the Nile). If elasmobranch are added, the total marine fish percentage (excluding *Mugil* sp.) is 2.15%. In other sites where marine fishes occur, rates are much lower.[180] Tell el-Dab`a (Sparidae: 0.17%, *Argyrosomus regius*: 0.08%, and *Mugil* sp.: 1.25%), Minshat Abu Omar 0.28%, 0.09%, and 0.85%), Tell el-Maskhuta (0.01%, 0,01% [indeterminate Sciaenidae], and 0.19%).

Ichthyofaunistic composition of sites in the main stream of the Nile is remarkably different. In Elephantine "pelagic" taxa predominate: *Lates niloticus*, *Bagrus domac*, and *Bagrus bayad*.

[172] No. 1, TG III, (forthcoming).
[173] No. 22, TG I, p. 251.
[174] No. 81**,** TG I, p. 311.
[175] P. R. Last and J. D. Stevens, *Sharks and rays of Australia* (Hobart, 1994).
[176] Compagno, "Sharks of the World. An annotated and illustrated catalogue of shark species known to date. Vol. 2. Bullhead, mackerel and carpet sharks.
[177] Marcolongo, *CRIPEL* 14; Fuscaldo, *Ciencia e Investigación,* vol. 11, No. 1-2, 31.
[178] Bietak, *Tell el-Dab´a II.*
[179] von den Driesch, *Documenta Naturae* 34.
[180] von den Driesch, *Documenta Naturae* 34.

## Fishing

The large amount of fish bones clearly indicates that fish were available nearby. Even very small and fragile bones are well preserved, indicating that the sample is a relatively good proxy of fishes consumed. However, it is probable that part of the small fishes were not recovered because sampling methods.

Certainly, ancient Egypt was a land of fishermen.[181] Ancient Egyptians used many different fishing gear: fishing spears, hooks (and poles), fish traps (barricade traps, weirs, basket traps), nets (hand nets, cast nets, seines) and even bare hands.[182] Many fishing implements have been recovered from archaeological sites and numerous representations on tombs and temples show their use.

In Tell el-Ghaba, the archaeofauna is dominated by fish. In agreement, several limestone and lead net weights and bronze hooks were found.[183] These pieces suggest that the inhabitants of Tell el-Ghaba used trawling or gill nets and lines with hooks. They could also fish with other methods or even with bare hands.

There are no small fishes (less than 10 cm SL) in the site. Most of the fishes correspond to medium sized to large fishes. The smallest fishes found correspond to species of *Oreochromis*, with some specimens of about 150 mm SL. This bias could indicate a selection, quite probably related to the fishing gears used; or could indicate differential preservation or collection. Most of the fish correspond to freshwater species that live and breed in shallow, poorly oxygenated, and vegetated waters (*Clarias/Heterobranchus* and *Oreochromis* sp.: 79.15%). Specimens of *Clarias* can be collected by hand, particularly during the spawning season.[184] The spawning season is thought to correspond with the annual period of inundation occurring in the late summer, but specimens of *C. gariepinus* collected near Luxor have been found to contain mature eggs as early as April.[185] Fish that occur in open waters are less abundant (*Synodontis shall*, *Mugil* sp., and the rare *Lates niloticus*, *Bagrus* sp., and *Hydrocyon* sp.: altogether 14.3 %). All these fishes, although less abundantly, also occur nearshore, and especially small specimens are close to the coast. The specimens of *Lates niloticus* identified are small.

The lower two levels appears of the site to have been occupied sporadically and seasonally flooded. The other occupation levels (III to VI) possibly escaped to flooding and there was permanent population. Fishing could have carried out all around the year. Fish species recorded suggest that most of the fishing was done in nearby, shallow bodies near the coast. Actually, quite probably there were no deep riverine environments nearby according to the paleogeographic reconstruction of Marcolongo[186] where the Nile ran at about 10 km from the site.

### Preparation of captured fishes

There is no evidence that catfish spines were used as arrow points or for other purpose in the site. *Synodontis* spines were used as arrow points in the Old Kingdom (for example, spines found in the tomb of Hemaka at Saqqara, 1st Dynasty; Cairo Egyptian Museum; ALC, personal observation). They do not appear to have been used as awls either.[187]

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[181] Germond and Livet, *An Egyptian Bestiary.*

[182] Brewer and Friedman, *Fish and Fishing in Ancient Egypt.*

[183] Fuscaldo et al., *REE* 6-7, 7-56; C. Kohen and A. L. Cione, this volume.

[184] G. Boulenger, *The fishes of the Nile,* London, 1907 (fide Brewer and Friedman, *Fish and Fishing in Ancient Egypt*).

[185] Brewer and Friedman, *Fish and Fishing in Ancient Egypt.*

[186] Marcolongo, *CRIPEL* 14.

[187] G. Brunton, G. and G. Caton-Thompson, *The Badarian Civilization and Predynastic Remains near Badari*, London, 1928 (Brewer and Friedman, *Fish and Fishing in Ancient Egypt,* 7).

Differential survival of the delicate bones of certain fish can potentially bias the archaeological record, leading to inaccurate assessments of the type of fish captured and their relative abundance.[188] In Tell el-Ghaba, we found that skull bones of *Clarias/Heterobranchus* are very abundant (2610 cranial bones from a total number of 3422: 76.3%). In contrast, very few cranial bones of *Synodontis schall* have been identified (36 cranial bones from a total number of 948 identified: 3.8%) notwithstanding that body bones are well preserved. All these fishes have very large heads with very heavy bones (Figure 2). Fishermen did and do cut off fish heads for not carrying extra weight often e.g. in South America.[189] However, species of genera *Clarias* and *Heterobranchus* have the capacity to breath air. Presently, karmoots are maintained alive in sinks in the Egyptian markets for several days (e.g. that of Ismaileya near the railway station, personal observation). It appears plausible that fishermen in Tell el-Ghaba area transported karmoots alive and perhaps maintained them into some kind of containers with water or small pools. For this, these fishes reached the place of cooking complete. We did not observed *Synodontis* specimens maintained alive in Egyptian markets. Quite certainly they have not the same tolerance for staying out of water as *Clarias*. Consequently, we suggest that many *Synodontis shall* specimens were transported without heads but with the pectoral girdles and pectoral spines to Tell el-Ghaba. Herodotus observed in the mid V century B.C. that peasant fishermen who lived near the marshes lived upon nothing but fish alone, which they gut as soon as they catched them, and eat after drying them in the sun.[190] Bates[191] notes that fishes in Egypt were split, gutted and head but backbones were not, as a rule, removed. Then, they were laid flat or hung up to dry. However, there are some examples of fishes dressed and head cut.

The other fish (mugilids, tilapias, etc.) have much smaller heads, which do not add much weight as to difficult transportation; we have found skull and postcranial bones of these fish.

No marks were observed on fish bones. Marks appear on a mammal bone in L1406 in Building L. Many bones were blackened by fire.

## Conclusions

- Excavations in Tell el-Ghaba (Saite Period; VII-VI century BC) in North Sinai (Egypt) have produced until now one of the largest collections of fish bones for any period of Pharaonic archaeology.
- This is the first published archaeoichthyological study for the Saite Period (VII-VI century BC).
- The faunal evidence indicates that there was easy access to habitats with abundant freshwater fish contrasting with the present desertic environment. Most probably, fishes were procured locally instead of provided by a central organization.
- Along with the fishes, marine and continental turtles, crocodiles, birds, and mammals were found. Fishes constitute about 88 % (NISP) of the vertebrate findings, being very important in the diet. Mammals and birds were certainly important in the diet. Reptiles are much less abundant.
- The archaeoichthyofauna is dominated by clariids, *Synodontis schall*, *Oreochromis* sp. and *Mugil* sp. Besides, this is until now the only site with comparatively abundant marine fishes in Pharaonic Egypt. No particular pattern of freshwater or marine fish distribution was detected among the different loci, buildings and/or strata.

[188] Brewer and Friedman, *Fish and Fishing in Ancient Egypt.*
[189] Cione and Tonni, *El Dorado Bulletin* 3.
[190] Germond and J. Livet, *An Egyptian Bestiary*.
[191] O. Bates, *Ancient Egyptian Fishing* (Cambridge, 1917).

- The most common fishes inhabit shallow water environments and/or can stand relatively high salinity. For this, we consider likely that most of them were caught in the nearby eastern lagoon. There are fishes of marine origin (Sparidae, Sciaenidae, Mugilidae, Carcharhiniformes, Lamniformes, Batoidei) and also marine turtles, where fished in the lagoons and/or were brought from the coast.
- Tell el-Ghaba is the first Pharaonic site with several elasmobranch taxa. New taxa for Pharaonic Egypt are: the elasmobranchs *Sphyrna* cf. *lewini*, *Carcharhinus* cf. *oscurus*, Batoidei indet., and *Carcharias taurus*; and the marine turtles Chelonidae indet.
- It might be possible that fishermen in Tell el-Ghaba area transported karmoots alive from the site of catching to the site of consumption. We suggest that most *Synodontis* specimens were transported to Tell el-Ghaba without heads but with the pectoral girdles. Girdles are useful for transportation if a pole or cord is passed by them. The other fish (mugilids, tilapias, etc.) have much smaller heads, which do not add much weight as to difficult transportation.
- There are no small mammals and most probably correspond to domestic animals. We identified *Sus scrofa*, *Equus asinus* and *Canis familiaris*. Birds remains probably correspond both to domestic and wild species. Freshwater turtles and crocodiles certainly were hunted nearby.

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Paleogeography of northern Sinai, with the Pelusiac branch (modified from Bietak, 1975; Marcolongo, 1993; and Chartier-Raymond and C. Traunecker, 1993).
The Pelusiac branch corresponds to Roman times, and possible to Saite times.

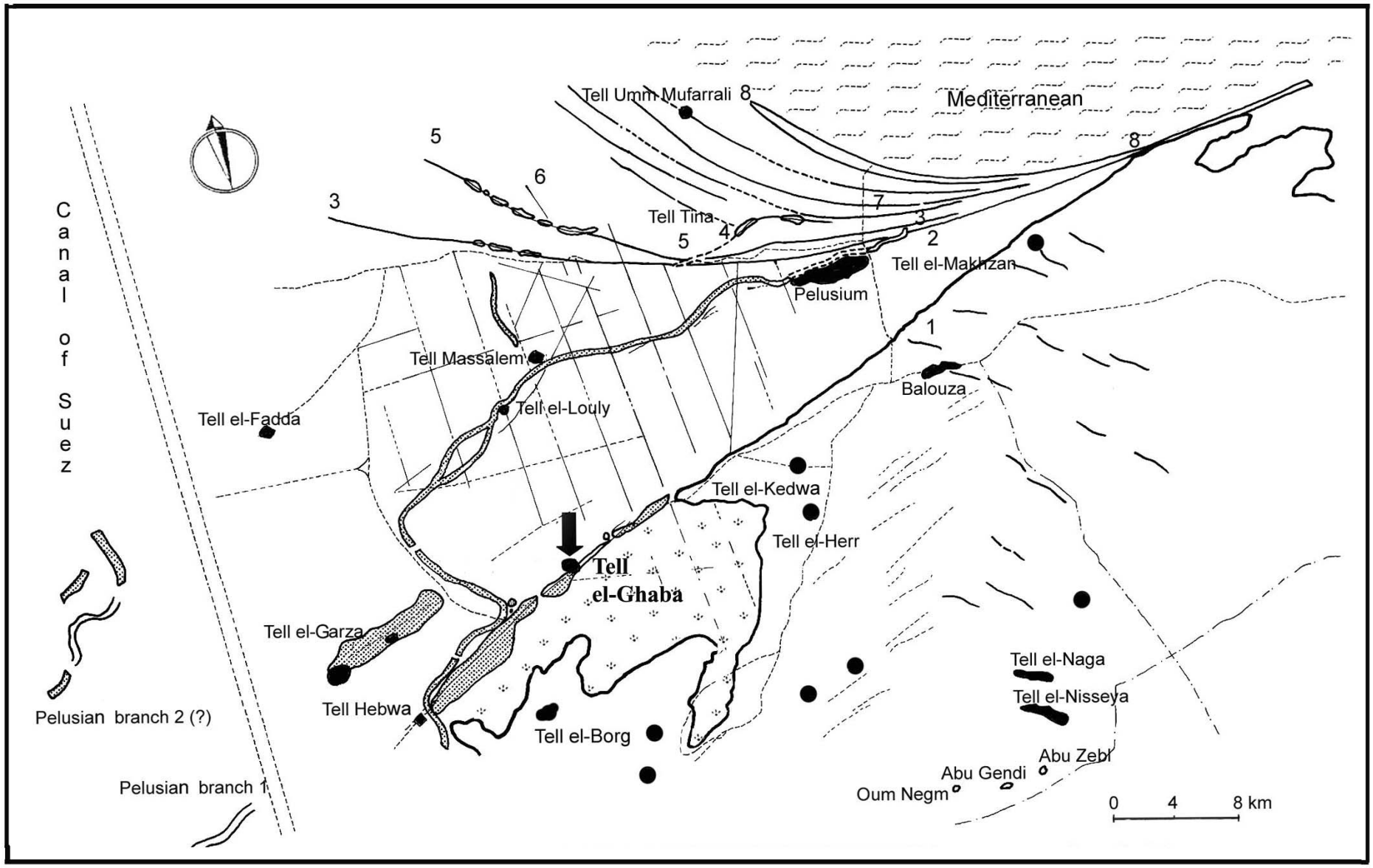



Fig. 1

Fishes present at Tell el-Ghaba.
A, *Bagrus docmac*, B, *Synodontis schall*. C, *Clarias gariepinus*. D, *Hydrocyon gorskalii*.
All redrawn from Boulenger and von den Driesch.

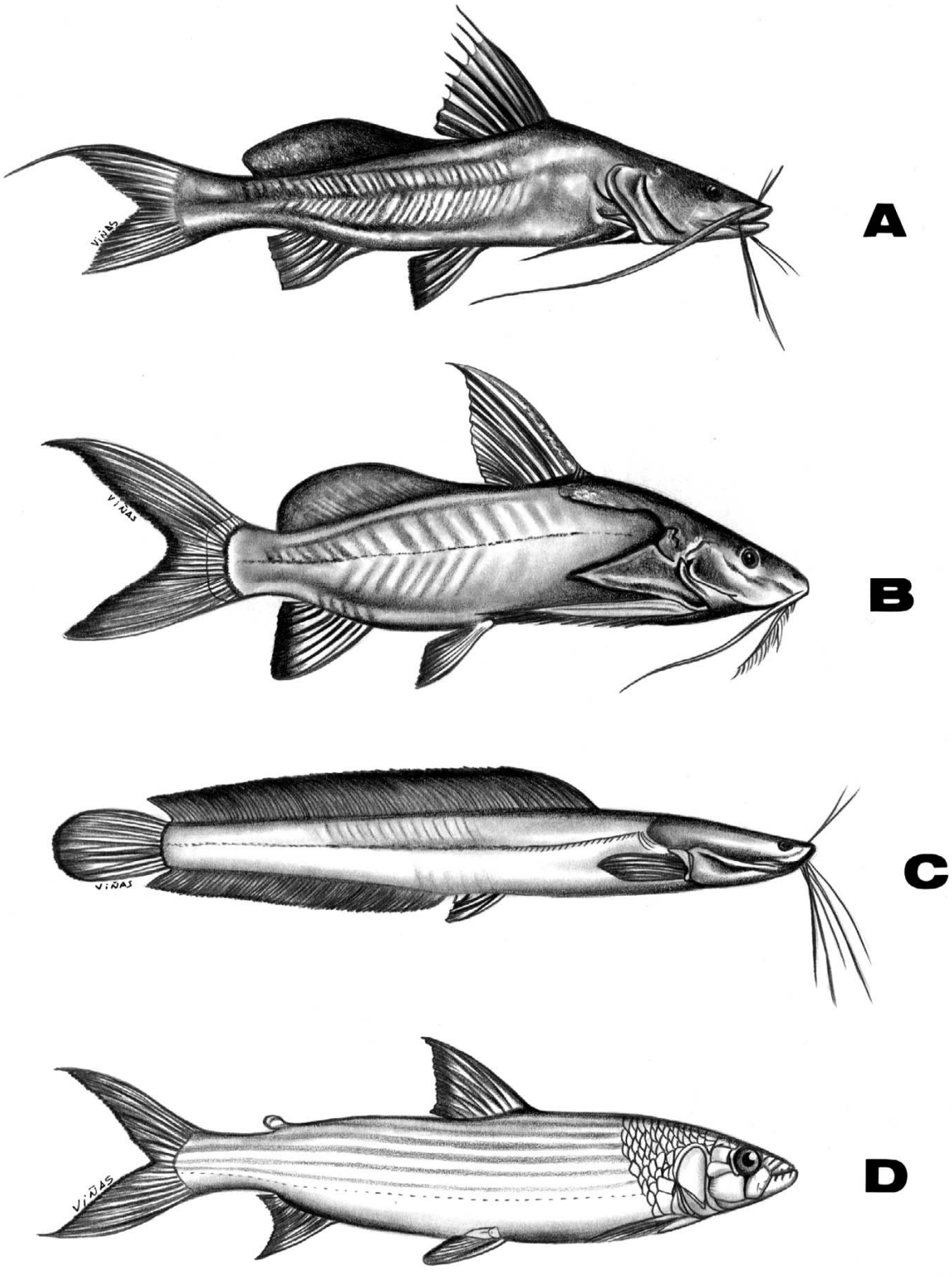
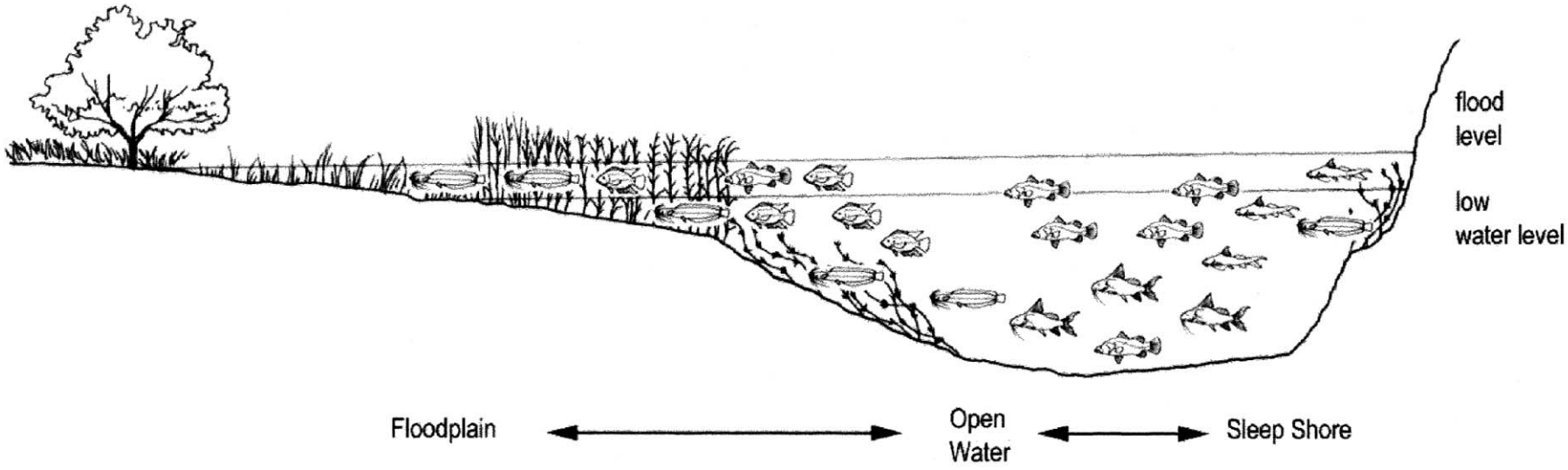



Fig. 2

Schematic reconstruction of aquatic freshwater habitats of some northeastern African fishes (modified from Peters et al. 2003, 333).




| | | | |
|---|---|---|---|
| Water Depth | shallow | deep | deep |
| Water Plants | many | none | few |
| Water Quality | muddy, hypoxic, warm saline | well oxygenated, less warm, less | saline |
| Diversity | very low | hight | low |
| Fish Species | *Clariidae* / *Tilapiini* | *Lates niloticus* / *Synodontis sp.* / *Bagridae* | |

Fig. 3

A, cleithrum of *Synodontis shall.* B, operculum of *Oreochromis* sp. C, vertebra of *Sphyrna* cf. *lewini.*
D, pectoral finspine of *Synodontis shall*. F, urohyal of *Clarias/Heterobranchus*.
G, mesethmoides of *Clarias/Heterobranchus.* H, neural plate of Cheloniidae.

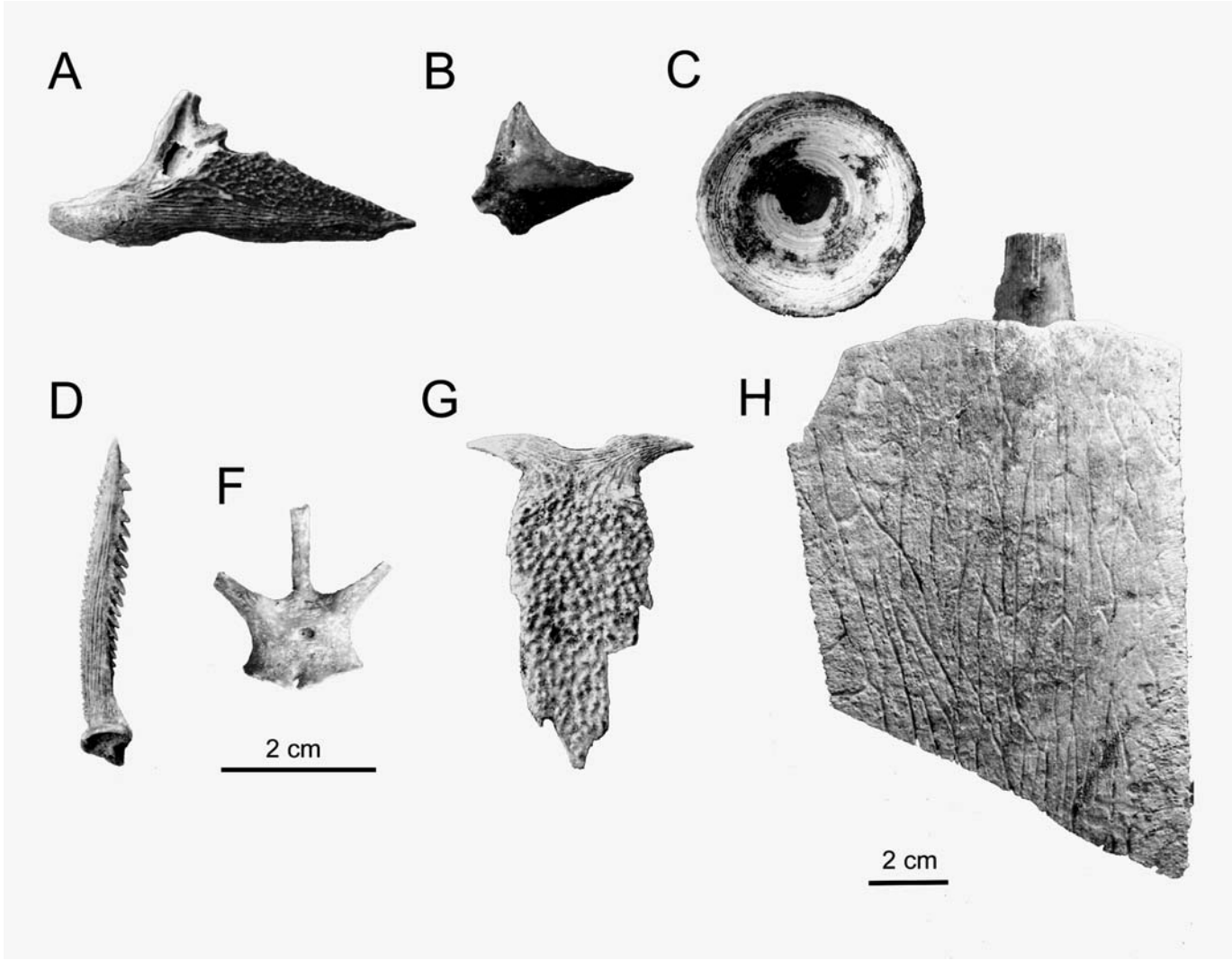



Fig. 4

Fishes present at Tell el-Ghaba.
A, *Argyrosomus regius.* B, *Oreochromis niloticus*. C, *Sparus auratus.* D, *Mugil capito*.
All redrawn from Boulenger and von den Driesch.

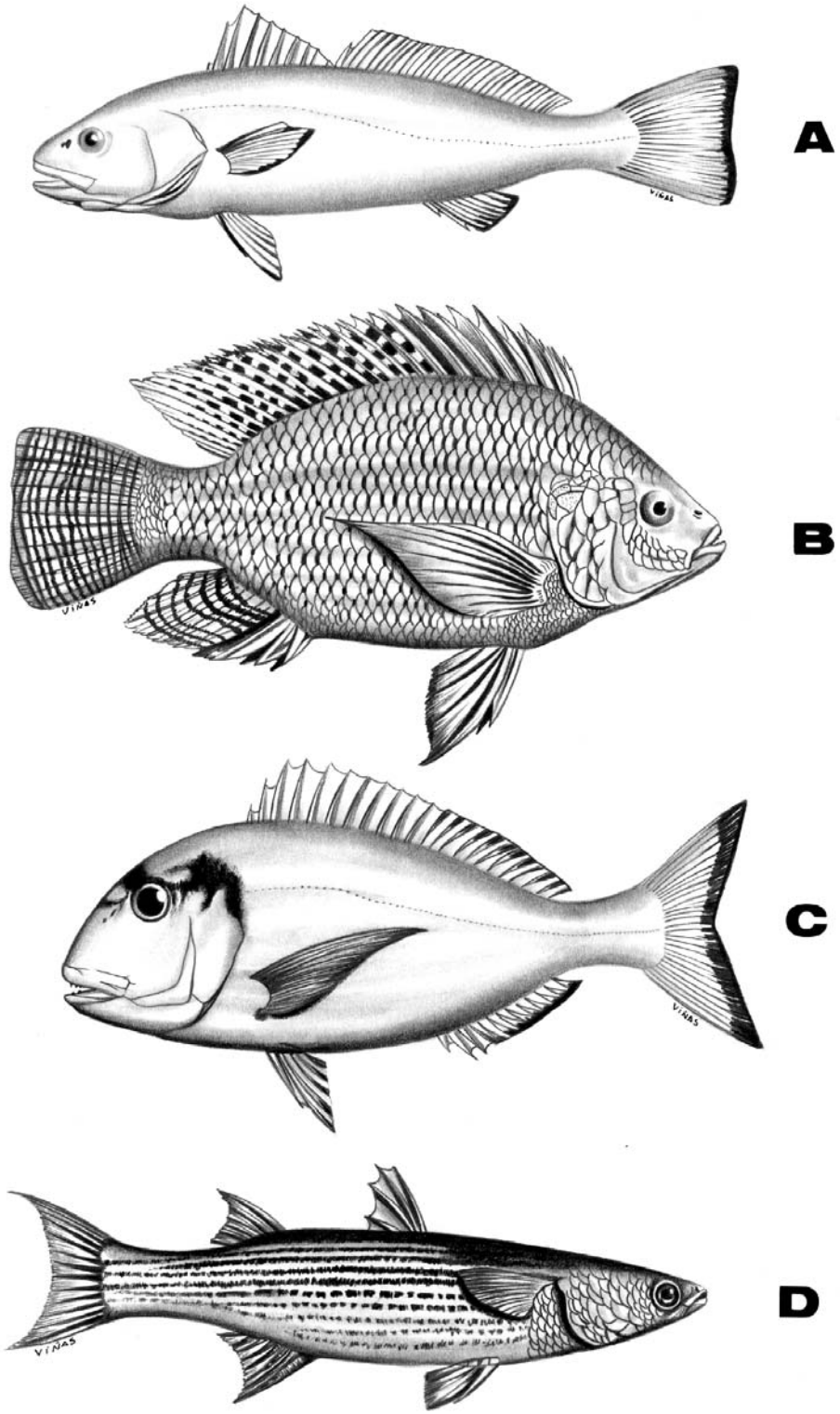



Fig. 5

*Sparus auratus*.
Left, occlusal view of a juvenile dentary. Center, occlusal view of a juvenile premaxilla. Right, occlusal view of an adult dentary.

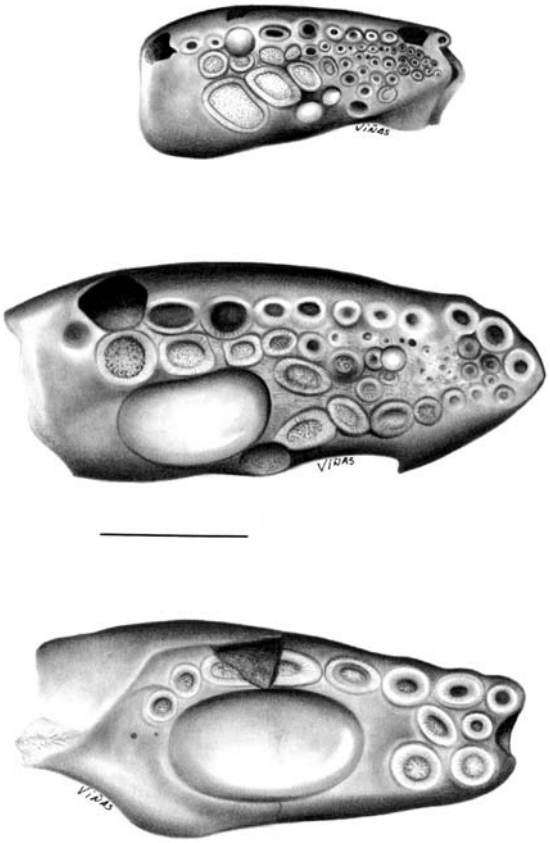


Fig. 6

*Carcharias taurus*.
Second upper tooth.

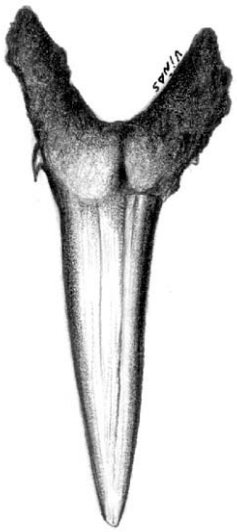


Fig. 7

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To stick here Table I

To Stick here Table II

# TAXA

| TAXA | Tell el-Ghaba | Elephantine | North Karnak | Merimde-Benisalame | Tell el-Dab´a | Qantir | Minshat Abu Omar | Tell Maskhuta | Maadi | Qasr el-Sagha / Fayum |
|---|---|---|---|---|---|---|---|---|---|---|
| Polypterus bichir | | | x | x | x | | | | | |
| Gnathonemus cyprinoides | | | | x | | | | | | |
| Mormyrops sp | | | | x | x | | | | x | |
| Mormyrops anguilloides | | x | | | | | | | | |
| M. kannume and M. caschive | | x | | | | | | | | |
| Hyperopisus bebe | | | | x | x | | | | | |
| Hydrocynus sp. | x | x | | x | | | | x | | |
| Alestes sp | | x | | x | x | | | x | | |
| Distichodus sp. | | x | x | | x | | | | x | |
| Barbus bynii | | x | x | x | x | | | x | | x |
| Labeo sp | | x | | x | x | | | x | x | |
| Citharinus sp | | | x | x | x | | | | | |
| Cyprinidae indet. | | x | | | | | x | x | | |
| Synodontis frontosus | | x | | | x | | | | | |
| Synodontis serratus | | x | | | | | | x | | |
| Synodontis membranaceus | | x | | | x | | | x | | |
| Synodontis sorex | | x | | | | | | | | |
| Synodontis batensoda | | | | | x | | x | | | |
| Synodontis schall | x | x | | x | x | | x | x | x | x |
| Synodontis sp | | | x | | | x | x | x | | |
| Auchenoglanis occidentalis | | x | | x | | | | x | | |
| Chrysichthys sp. | | | | x | | | | | | |
| Eutropius niloticus | | | | x | x | | | | | |
| Schilbe mystus | | | | x | x | | | | | |
| Clarias/Heterobranchus | x | x | x | x | x | x | x | x | x | x |
| Bagrus sp. | x | x | | x | x | | | x | x | |
| Malapterurus electricus | | | | x | | | | | | |
| Mugil sp. | x | | x | x | x | x | x | x | | x |
| Lates niloticus | x | x | x | x | x | | x | x | x | x |
| Argyrosomus regius | x | | | | x | | x | x | | |
| Oreochromis sp. | x | x | x | x | x | x | x | x | x | x |
| Sparus auratus | x | | | | x | | x | x | | |
| Morone punctatus | | | | | x | | | | | |
| Tetrodon fahaka | | x | | x | | | | | x | x |
| Teleostei indet | x | | | | | | | | | |
| Carcharias taurus | | | | | | | | | | |
| Carcharhinus cf. obscurus | x | | | | | | | | | |
| Sphyrna cf. lewini | x | | | | | | | | | |
| Batoidei indet. | x | | | | | | | | | |
| Elasmobranchii indet. | x | | | | | | | | | |

# Fishing Techniques at Tell el-Ghaba

**by Claudia Irene Kohen and Alberto Luis Cione**

**Abstract**

The large quantity of fish bones retrieved from archaeological excavations at Tell el-Ghaba clearly shows the importance of fishing as a permanent activity in all occupational levels. Recovered material consists of a few hooks and a large quantity of net sinkers in lead and stone. This material has been catalogued and compared to other collections along Egypt and Nubia, as well as depictions and models found in tombs from different periods. According to this evidence, fishing techniques at the site do not differ from those used along the Nile throughout the Dynastic period.

## Introduction

Taphonomic processes at Tell el-Ghaba derived in the loss of the animals' soft tissue and delicate bones, so that the remains of aquatic species are mainly constituted of fish isolated bones and teeth, mollusc shells, turtle shells and crocodile bony scales. As already mentioned elsewhere,[1] about 80% of the fish consumed at the site are shallow water adapted fishes (*Clarias/Heterobranchus* and *Oreochromis sp*). The rest consisted of more eurioic continental taxa such as *Synodontis schall*, a small proportion of more open, well oxygenated water species such as *Lates niloticus* and some marine and amphibiotic fish varieties.

Knowledge of Ancient Egyptian fishing methods and equipment is mainly based on archaeological sources, the extraordinary artistic representations of daily life and to a much lesser extent on written documents.[2] Regarding archaeological evidence, the extant material now in museums and other collections is not numerous;[3] this accounts most probably for a bias in the focus of archaeological research for the Dynastic period.[4] Concerning fishing scenes on tomb walls, it is important to be aware that, although very descriptive, they were depicted above all for magic and symbolic purposes. Ethnographic comparisons have also been used in the understanding of early fishing techniques.[5]

## Fishing techniques

Most fishes present at the site were numerously depicted on tomb walls, as well as the techniques for their capture. These were most varied and recovered species at Tell el-Ghaba could be caught either by the bare hand (especially some taxa such as *Clarias gariepinus*) or by the use of traps (barricade traps, weirs, basket traps), nets (hand nets, cast nets, seines) clubs, poles, lines and hooks, spears and harpoons.[6] Fishermen could either fish on boats,

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[1] Cione, in this volume, 103-133.

[2] D. J. Brewer and R. F. Friedman, *Fish and fishing in Ancient Egypt* (Warminster, 1989), 2.

[3] Brewer and Friedman, *Fish and fishing in Ancient Egypt*, 1.

[4] For a further discussion on this topic, see: D. O´Connor, "Ancient Egypt: Egyptological and Anthropological Perspectives", in J. Lustig (ed.), *Anthropology and Egyptology* (Sheffield, 1997), 15.

[5] L. Loat, "Mr. Loat´s Report on the Nile Fish Survey", in G.A. Boulenger, *The Fishes of the Nile* (London, 1907), xx-li; A. von Brandt, *Fish catching methods of the world* (Farnham, 1984).

[6] Ancient Egyptian iconography on different fishing techniques: for the use of traps, P. Lacau, "La Panier de Pêche Égyptien", *BIFAO* LIV (1954), 138-145; H. E. Winlock, *BMMA* 27, part II (1932), fig. 31. For the use of nets: A. M. Blackman, *The Rock Tombs of Meir*, part I (London, 1914), Pl. III; specifically for the use of the seine see footnote 8 in this work. For the use of line and harpoon: Ll. Griffith, *Beni Hassan*, Part I (London, 1900) Pl. XXXIV; P. E. Newberry, *Beni Hasan* (London, 1893), Pl. XXIX; O. Bates, "Ancient Egyptian Fishing", *Harvard African Studies* I (Cambridge, 1917), 232-249, Pl XII; H. E. Winlock, *Models of Daily Life in Ancient Egyp t* (Cambridge, 1955), 64-69 and Pls. 52; D . Sahrhage, *Fischfang und Fischkult im alten Ägypten* (Mainz am Rhein, 1998), Pls. 6,7 and figs. 24, 33.

along the riverside[7] or in shallow pools formed on the alluvial plain after the flood season.[8] "The different techniques were well established as early as the Old Kingdom, and evolved very little over the centuries".[9]

Fishing gear found in the excavation at Tell el-Ghaba are mostly limestone and lead net weights and very badly preserved metal (copper? iron?) fishhooks. One object made of wood, Inv. No. F0196A,[10] with a (broken?) barb on one side could have been used as a harpoon, although the barb seems too short for that purpose; perhaps the tool served as a throwing stick, although it is difficult to be certain.

## Hooks

The only object distinctly identified as a fishhook is Inv. No. F0029A.[11] It is a simple metal barb ending in a rounded curve; it presents no loop nor flange at the end of the shank to which the line could have been fastened and its actual size is 5.5 by 3.7 cm.[12] As it is partially corroded, it is almost impossible to assert its original shape. Inv. No F0872A,[13] although broken, is very similar.

An analysis of angling scenes in tombs provides evidence that, although several species appear attracted by the hook, representations of fish actually hooked are for the most part catfish, in particular the genus *Synodontis.*[14] According to these scenes, hooks were used alone or in "gangs" of 5 hooks attached to the end of the line.[15] No baits were depicted on the hooks.

### *Net weights*

Two kinds of net weights were recovered at Tell el-Ghaba: carved stone artifacts and lead sinkers.

- *Stone net weights*:

Stone net weights were used in fishing with the seine net. To better understand their functionality, a wooden model from the tomb of Meketre dating to the Middle Kingdom, as well as tomb depictions ranging from the Old Kingdom to the New Kingdom, are very illustrative. Scenes show a crew of fishermen standing on the bank of a river or channel or on a boat (or two crews on two boats working jointly) hauling in the seine and performing

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[7] A scene of three fishermen on the thicket carrying basket with fish and the legend "Coming forth the papyrus swamp…" in: D. Dunham, "A ´Palimpsest´ on an Egyptian Mastaba Wall", *AJA* 39:3 (1935), 300.

[8] For depictions of boat fishing: tombs of Ti, Mereruka, and Kagenmi in Saqqara, in: Brewer and Friedman, *Fish and Fishing in Ancient Egypt,* figs. 2.13, 2.30, 2.20. For depictions of boat and land fishing: tomb of Khnumhotep, in: Newberry, *Beni Hasan,* Pl. XXIX ; tomb of Idout in: Brewer and Friedman, *Fish and Fishing in Ancient Egypt,* fig. 2.31. About fishing in residual pools on the alluvial plain, see: W. van Neer, "Fishing along the Nile", *Late Prehistory of the Nile Basin and the Sahara* (Poznan, 1989), 53.

[9] P. Germond and J. Livet, *An Egyptian bestiary : animals in life and religion in the land of the Pharaohs* (London, 2001), 47.

[10] From Area I, L0001, Level VI (published in *Tell el-Ghaba* I, p. 197, No. 508 and Fig. 40:44, as a needle).

[11] From Area I, L0001, Level VI (published in *Tell el-Ghaba* I, p. 197, No. 513 and Fig. 40:45).

[12] It seems that hook design had changed by the New Kingdom. Instead of the loop at the end of the shank to attach the line, the former was hammered to form a small flange. The line was then fastened below the flange and secured in a more effective way. Bates, "Ancient Egyptian Fishing", 29; W. M. F Petrie *Tools and Weapons* (London, 1917), Pl. XLIV.

[13] From Area I, L0352, Level II (published in *Tell el-Ghaba* I, p. 77, No. 17 and Fig. 9:2).

[14] Brewer and Friedman, *Fish and Fishing in Ancient Egypt,* 30.

[15] Bates, "Ancient Egyptian Fishing", 248; W.M. von Bissing, *Die Mastaba des Gem-ni-kai*, vol I (Berlin, 1905), Pl. IV,2; footnote 5 in this book.

different tasks related to their activity.[16] According to these representations, the bottom line of the seine was weighted to fall vertically when in use; thus, numerous weights can be seen attached to the lower part of the net, while the upper line has been dressed with floats, apparently made of wood.[17] Although no floats have ever been recovered from archaeological sites, stone weights were found in excavations along Egypt and Nubia.

Tell el-Ghaba stone net sinkers were made of limestone as, seemingly, those in artistic representations, although they present some variations.[18]

According to their shape, stone weights at the site can be grouped into 4 categories:

1) The body of the weight is elongated and traversed by a longitudinal groove where the rope was attached. Within this category is *Inv. No. F0814* (Fig.1:1), a piece almost identical to the one on display at the Cairo Egyptian Museum and very similar to the one at the Petrie Museum, No. 7355 i, from Lahun and dating to the Middle Kingdom. Also, "two ovoid weights of limestone grooved longitudinally for a cord lashing" were found at Lisht dating to the Ramesside period[19].

2) A weight with an elongated body and a groove around its middle portion, *Inv. No.* F1087A (Fig. 1:2), is the largest and heaviest in our collection and was roughly whittled to its present shape. *Inv. No. F0473A* (Fig.1:3) is similar, although much smaller. This type is frequently depicted in artistic representations.[20]

3) Pieces in this category have a cylindrical or sub-cylindrical shape, 3 to 8 cm long. They were carelessly tailored, taking advantage, in some cases, of the natural shape of the limestone chip. Their particularity is that they have shallow suspended grooves; either one groove at one end of the body (*Inv. Nos. F0077A, F0234A, F0875A,* Fig. 1:4), or two grooves, one at each end (*Inv. Nos. F0183A, F0242, F1079A* -Fig.1:5-, *F0346A, F0378A, F0401A, F0572A, F0573A, F0574A, F0583A, F0911A, F0934A, F0935A*). It is difficult to determine why two grooves were incised instead of one, a possible answer being that, when lashed, the sink would remain parallel to the bottom line of the net and better secured. Although no depiction in Egyptian iconography shows anything like this, archaeological material retrieved from a Prehistoric site in northern Chile shows that a similar object was used as a part of a fishing hook, in which one of the grooves was used to bind the line and the other to fasten a barb made of bone.[21]

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[16] Fishermen dragging the net on a river bank: relief of the tomb of Rahotep at Medum (4th Dynasty), Ägyptisches Museum, Berlin, in: Sahrhage, *Fischfang und Fischkult im alten Ägypten,* fig.14. Some scenes in which the seine is hauled from one boat: tomb of Rahotep. in: Brewer and Friedman, *Fish and Fishing in Ancient Egypt,* fig. 2.28; tomb of the Two Brothers at Saqqara (5th Dynasty), in: A. M. Moussa and H. A. Alternmüller, *Des Grab des Nianchchnum und Chnumhotep* (AVDAIK 21; Mainz am Rhein, 1977); Old Kingdom tomb of Aba in: N. de G. Davies, *The Rock Tombs of Deir el Gebrâwi* (London, 1902), Pl. IV; tomb of Zau (6th Dynasty), in: N. de G. Davies *The Rock Tombs of Deir el Gebrâwi,* Pl. V. Seine nets manipulated from land and on boat: tomb of Akhanekht at el-Bersheh (First Intermediate Period) in: Ll. Griffith and P. E. Newberry, *El Bersheh*, Part 2 (London, n.d), Pl. XVI. For seine fishnet scenes in two boats see wooden model in the tomb of Meketre, in: H.E. Winlock, *Models of Daily Life in Ancient Egypt* (Cambridge, 1955), 64-69 and Pls. 52, 53; the Ramesside tomb of Ipuje at Deir el-Medina, West Thebes, in: N. de G. Davies, *Two Ramesside Tombs at Thebes* (Robb de Peyster Tytus Memorial Series, PMMA 5, New York, 1927).

[17] Bates, "Ancient Egyptian Fishing", 259.

[18] Sinkers reproduced in fishing scenes seem to be of two classes: those pear shaped, pierced for vertical suspension (like those, for example, in the Tomb of Rahotep, or on the wooden model in the tomb of Meket-Ra) and those with an elongated body and a shallow groove around the centre of the weight (like those in the Tomb of the Two Brothers and the Tomb of Ti).

[19] Hayes, *The Scepter of Egypt,* 408.

[20] See footnote 14.

[21] E. Nordenkjold, *Modifications in Indian culture through inventions and loans* (Comparative Ethnographical Studies 8, Goteborg, 1930), 72.

Generally, weights in this class have arbitrarily been identified in archaeological literature either as loom weights or as net sinkers.[22] It is probable, of course, that the same object was used in more than one activity. Very similar items from other sites, some made of baked clay, also seemed to have served the same function.

Several pieces from Nile valley sites resemble objects in this class:

- limestone weight with a groove at each end of the body, identified as "loom weight", from a shaft at Lisht, within the pyramid complex of Senworset I; dimensions: L 7.3, Th. 2.7 cm.[23]
- baked clay cylinders with a groove at each end and another along its length; catalogued: "loom weights?", found at Hierakonpolis, dating to the Early Dynastic period (Cat. No. 142: L. 4.3, D. 2.0 cm; No. 144: L.5.4, D 2.7 cm; No. 145: L 7.4, D 2.5cm).[24]
- Petrie Museum No. 47589, catalogued as "limestone loom weight", roughly carved with a two incised lines for the string, dating to the Late Period, found at Memphis; dimensions: L. 3.5, Th. 1.2 cm.
- Petrie Museum No. 71589, identified as "pottery bar with thick groove at each end, perhaps weight for loom or net. Roman Period?"
- Petrie Museum No. 21262, pottery cylinder with a groove around one end identified as "black/red ware pottery sinker" from the fort of Buhen, Nubia; dimensions: L. 6.2, W. 2.5, H. 3.4 cm.
- Petrie Museum No. 21263 in baked clay is also from Buhen, with two grooves, one at each end; dimensions: L. 7.5, W. 3, H. 5 cm.
- Three limestone weights almost identical to those of Tell el-Ghaba were found at Tell el-Dab`a and identified as net sinkers. Their dimensions are: L. 8.5 cm, W. 5.2 cm, Th. 3.6 cm (Inv. 7013); L. 5.1 cm, W. 3.7 cm, Th. 3.5 cm (Inv. No. 7013A), and L. 10.4 cm, W. 4.7 cm, Th. 3.1 cm (Inv. 5147).[25]

4) Conical shape with vertical perforation. Although we believe that this class was used in fishing, its use as spindle whorls or loom weights must not be dismissed (*Inv. Nos. F0157A* -Fig.1:6-, *F0241A, F0328A, F0347A, F0478A, F0673A, F0739A, F0816A*). The same object was found at Tell el- Balamun, in the Delta region; it is described as "a roughly shaped loom-weight or net- sinker of limestone, circular in shape with central perforation. L: 4, D: 4.9 cm. Third century BC".[26] At Amarna, a very similar object to *F0739A* made of limestone, roughly decorated and dating to the New Kingdom is described as a "possible spindle whorl"; its dimensions are approximately H 3., D 6.4 cm.[27]

A variation in this class is a tapered disc with "parcel like" grooves to fasten the lashes (*Inv. Nos. F0401A, F0496A, F0913A, F0936A, F0941A* -Fig.1:7-, *F0948A*). At Amarna, a New Kingdom object almost identical to *Inv. No. F0396A*, was catalogued as a "possible spindle whorl with a diameter of 6 cm.[28]

*- Lead net sinkers:*

Although no lead weights seem to have been depicted on monuments,[29] a cast net found at Gebelein (or perhaps a funeral model of a cast net) dating to the 18th Dynasty "made up of linen cord knotted to form a fine, diamond mesh … was provided around its perimeter

[22] As seen in references along this work. For a discussion on the matter of "loom weights *vs*. net weights" see B. Adams, *Ancient Nekhen* (Surrey,1990), 166.

[23] D. Arnold, *The Pyramid Complex of Senworset I* (The South Cemeteries of Lisht, III; New York, 1992), 67 and Pl. 80.

[24] Adams, *Ancient Nekhen,*167.

[25] E. Czerny, *Tell El-Dab´a IX* (Wien, 1999), Pl. 52, 115.

[26] A. J. Spencer, *Excavations at Tell El-Balamun 1991-1994* (London, 1996), 75 and Pl. 71.

[27] B. Kemp and G. Vogelsang-Eastwood, *The Ancient Textile Industry at Amarna* (London, 2001), 287.

[28] Kemp and Vogelsang-Eastwood, *The Ancient Textile Industry at Amarna,* 287.

[29] Bates, "Ancient Egyptian Fishing", 259.

with several dozen small lead weights".[30] What is certain is that when used, these weights were used in large quantities. Nearly 40 lead sinkers[31] have been recovered, so far, at Tell el-Ghaba and, except for two cases, they were all retrieved from Area I. Lead sinkers found at the site are of two classes: the most frequent are U-shape, made of a folded or twisted lead sheet with an average size of 2.6 by 1.8 cm,[32] and a few moulded rings.[33] Similar to those in the first group were found by Petrie in Abydos, dating to the Middle Kingdom (Petrie Museum No. 43100) and in Gurob probably from the 18th Dynasty (Petrie Museum Nos. 7938, 59081, 59082, 59083). They were also found in a Ramesside household context at Lisht.[34]

## Archaeological contexts

Few of the recovered fishing tools were found in association with significant archaeological features; most of them were retrieved from topsoil, refilling levels, and mostly from conflagration stratum L0001 (Level VI). Remains of flimsy structures and numerous hearths, associated with abundant fish and fishing gear in the first occupational level of Area I (L0349, L0266 and L0371), suggest that fishermen frequented this part of the site on a non permanent basis.[35] On the second occupational level, in one of the foundation trenches (L0352) and on the floor of Building A (L0040) and in a large quantity of net sinkers and fishing hooks were found. A fishing tool was recovered from the floor (L0271 = L0283) of room B-5 (Building B), the fourth settlement level of Area I.

## Conclusions

Extreme salinity of the soil as well as chemical weathering processes (i.e. raise in the water table levels) in Tell el-Ghaba contributed to the corrosion of ferrous artifacts and the decay of fragile objects; nets, netting needles and other items have consequently not survived. Recovered fishing tools (i.e. stone and lead net weights and a few hooks) do not substantially differ from those in other sites along the Nile; it seems also that fishing instruments have remained, at least in some cases, almost unchanged through time. Artistic representations dating to the Pharaonic period allow us to get a glimpse of how the activity was actually performed in the marshy areas of the Nile Delta. Consequently, fishing tools preserved should only represent a part of the total fishing instruments that the inhabitants should have used.

Fish remains and fishing equipment appear, with more or less frequency, in all occupational levels and is clear that fish must have been an important constituent in the diet of the site settlers. Most of the fish species recovered were most probably caught in nearby shallow waters.[36]

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[30] W. C. Hayes, *The Scepter of Egypt,* Vol. II (New York, 1959), 214.

[31] For Inv. Nos. see the Catalogue at the end of this article

[32] As those found by Petrie at Gurob and dating to the 18th Dynasty. See: Petrie Museum, Cat. No. 7938, 59081,59082, 59083; W. M .F. Petrie *Kahun, Gurob and Hawara* (London, 1890), 34 and Pl. XVIII, 18. Also similar to ours are 8 found pressed together around the perimeter of a fragmented casting net at Lisht village and dating to the New Kingdom, in Hayes, *The Scepter of Egypt,* 408.

[33] According to Bates, these ring shaped weights were apparently quite common in Graeco-Roman sites in Lower Egypt. See: Bates, "Ancient Egyptian Fishing", 259.

[34] Hayes, *The Scepter of Egypt,* 408.

[35] Crivelli, in *Tell el-Ghaba III* (forthcoming).

[36] Cione, in this volume

## Catalogue of limestone net weights

**- Inv. No. F0036A**. Fragmentary. 4.6 x 2.9 x 2.1 cm.[37] Light olive grey. Not centred axial perforation. Similar to Inv. No. F0157A (*Area II, L1031, Find No. 001).*
**- Inv. No. F0077A**. Complete. 8.6 x 4.9 x 4.1 cm. Colour: white. Oval shape, it has a suspension groove around the circumference at one end; badly preserved (*Surface*).
**- Inv. No. F0118A** (before Inv. No. F0946B). Unfinished object. Colour: ---. D: 5.3 cm, axial perforation. Weight: 161 g. Conical shape? *(Area I, L0018, Find No. 025).*
**- Inv. No. F0157A** (Fig.1:6). Fragmentary, just one half has been preserved. 3.0 x 2.5-4.0 x 1.5 cm. 5PB 6/1 bluish grey. Dome shaped and axial perforation: 1.0 cm. Similar to Inv. No. F0036A (*Area I, L0001, Find No. 008*).
**- Inv. No. F0183A.** Complete. 6.8 x 4.1 x 2.9 cm. 10YR 8/4 very pale brown and 10YR 4/4 dark yellowish brown. Elongated body with one suspension groove at each end. Similar to Inv. Nos. F0242, F0346A, F0401A, F0911A, F0935A (*Area II, L1060, Find No. 004*).
**- Inv. No. F0234A.** Complete. 7.7 x 3.0 x 3.0 cm. Oval shape, with one stringing groove around the circumference at one end (*Area II, L1008*).
**- Inv. No. F0241A.** Fragmentary, roughly made; one face is complete, the lower part of the other is partially broken. 4.81 x 2.21 cm. 10YR 8/1 (white), 10YR 8/2 (very pale brown). Conical shape, axial perforation *(Area II, L1054, Find No. 001*).
**- Inv. No. F0242** (SCA No.1037). Complete, it has a round depression on one of its faces. 4.0 x 8.3 cm. 10YR 8/1 white. Elongated body with a suspended groove around the circumference at each end. Similar to Inv. Nos. F0183A, F0346A, F0401A, F0911A, F0935A *(Area II, L1054, Find No. 002;*).
**- Inv. No. F0328A (SCA No. 2022).** Complete, very eroded. 3.8 x 4.3- 3.1 cm. Conical shape, axial perforation: 0.8 cm. Similar to Inv. Nos. F0241A, F0036A *(Area I, L0271, Find No. 008*).
**- Inv. No. F1079A** (before F0343A) (Fig.1:5). Fragmentary, eroded. 3.3 x 1.6 cm. 2YR 6/2 (pale red) and 5/2 (reddish brown). Cylinder with one stringing groove at each end around its circumference *(Area I, L0257, Find No. 013).*
**- Inv. No. F0346A.** Fragmentary, eroded. 6.8 x 3.6 - 2.9 x 2.7 cm. 10YR 8/1 (very pale brown), spots: 4.5YR 4/3 (brown). Roughly cylindrical body with two stringing grooves around the circumference, one at each end. The limestone chip has roughly been whittled to its present shape. Similar to Inv. No. F0183A *(Area I, L0247, Find No. 027).*
**- Inv. No. F0347** (SCA No. 2024). Complete, polished. 2.9 x 4.3 cm. 5YR 3/2 dark reddish brown. Conical shape, axial perforation: 0.8 cm in the upper part; 0.9 cm in the base *(Area I, L0047, Find No. 012a).*
**- Inv. No. F0378A.** Complete, badly preserved. 3.4 x 1.8 x 1.5 cm. 5YR 7/3 pink. Elongated body, roughly cylindrical, two stringing grooves around the circumference, one at each end *(Area I, L0001 Find No. 001).*
**- Inv. No. F0396A.** Fragmentary. 5.2 x 1.5 cm. 5YR 7/4 pink in the middle, 4/3 reddish brown) Tapered disc with 5 stringing grooves *(Area III, BX/85, L2001, Find No. 009).*
**- Inv. No. F0401A.** Complete, eroded; grooves have partially faded away. 8.6 x 4.4 – 3.0 x 3.6 cm. 10YR 6/3 pale brown, 7/2 light brown. Roughly cylindrical, two grooves around its circumference, one at each end *(Area II, BD/69, topsoil, Find No. 002).*
**- Inv. No. F0473A** (Fig.1:3). Fragmentary; polished. 2.2 x 1.3 x 1.1 - 0.9 cm. 2.5YR 7/3 pale yellow. Elongated shape, with a suspension groove in the middle of the body (groove section: 0.1 cm) *(Area I, L0247 Find No. 026).*
**- Inv. No. F0478A.** Fragmentary. D: 3.6 cm. 7.5YR 8/3 pink. Conical shape with axial perforation. Similar to Inv. No. F0816A *(Area II, BE/72, topsoil, Find No. 001).*

[37] Munsell colour.

**- Inv. No. F0496A.** Complete. 5.6 x 5.4 x 1.7 cm. 7.5YR 4/2 and 7.5YR 5/3 brown. Tapered disc with axial perforation: 1.0 cm *(Area I, L0001, Find No. 009).*

**- Inv. No. F0572A.** Eroded, grooves partially faded away. 6.9 x 4.0 x 4.2 cm. Elongated body, two grooves around its circumference, one at each end. Similar to Inv. Nos. F0183A, F0242, F0346A, F0401A, F0911A *(Surface).*

**- Inv. No. F0573A.** Dimensions: 9.2 x 4.3 x 2.1 cm. White. Elongated body, two grooves around its circumference, one at each end; flattened on one of its sides, it was roughly shaped from the limestone chip *(Area I, L0247).*

- **Inv. No. F0574A.** Complete. 6.8 x 4.2 cm. Greyish. Elongated body, flattened on one of its sides. It has two grooves around its circumference, one at each end. Roughly whittled *(Area I, L0233, Find No. 028).*

- **Inv. No. F0583A.** Complete. 6.9 x 4.3 x 4.4 cm. White. Sub-cylindrical, elongated body, two grooves around its circumference, one at each end. Roughly fashioned *(Area II, L1228).*

**- Inv. No. F0673A.** Fragmentary. 4.15 x 3.06 x 4.13 cm; axial perforation: 0.92 cm. 10YR 7/4 very pale brown. Cylindrical shape with axial perforation *(Area VI, AY/57, topsoil, Find No. 009).*

**- Inv. No. F0739A.** Complete. 4.9 x 2.7 cm. 10YR 7/3 very pale brown. Domed shaped, axial perforation; ten stringing grooves *(Area V, L5003).*

**- Inv. No. F0814** (SCA No. 4004), (Fig.1:1). Complete. 8.2 x 4.5 x 3.2 cm. Ovoid shape, traversed by a longitudinal suspended groove *(Area VI, L0511, Find No. 011).*

**- Inv. No. F0816A.** Fragmentary. Dimensions: 5.2 x 4.9 x 2.6 cm. 10YR 8/1. Conical shape with axial perforation. Similar to Inv. No. 478 (*Area VI, L0511, Find No. 008).*

- **Inv. No. F0875A** (Fig.1:4). Complete. 10.7 x 4.8 - 5.3 x 4.6 - 4.9 cm. 2.5YR 7/2 light grey. Sub-cylindrical shape with stringing groove on one end, 3 mm wide *(Area I, L0360, Find No. 010).*

- **Inv. No. F0911A** (before F0911B). Complete. 6.3 x 3.4 x 3.3 cm. Greyish white. Sub-cylindrical, elongated body; two grooves around its circumference, one at each end *(Area VI, , Find No. 005).*

**- Inv. No. F0913A** (before F0913B). Condition: ---. 5.8 x 5.5 x 2.0 cm. Greyish white. Tapered disc, "parcel" like grooves. 7 + x grooves *(Area II, L1234, Find No. 024).*

**- Inv. No. F0934A.** Complete. 7.7 x 4.4 x 3.7 cm. Sub-cylindrical shape with two stringing grooves, one at each end, 3 mm wide. Similar to Inv. Nos. F0183A, F0242, F0346A, F0401A, F0911A, F0935A *(Area II, L1406, Find No. 013).*

**- Inv. No. F0935A.** Complete. 3.6 x 1.9 x 1.6 cm. Sub-cylindrical, elongated body, with two stringing grooves around the circumference. one at each end 2 mm wide. Similar to Inv. Nos. F0183A, F0242, F0346A, F0401A, F0911A, F0934A *(Area II, L1235, Find No. 025).*

**- Inv. No. F0936A.** Complete. 5.5 x 2.8 cm. Dome-shaped; three stringing grooves. 2 mm wide, and axial perforation, 9 mm wide. Found covered by sand and two fish ribs *(Area I, L0266, Find No. 012).*

**- Inv. No. F0941A** (Fig:1:7). Fragmentary. 5.4 x 5.2 x 2.0 - 3.0 cm. Tapered disc? *(Area I, L0349, Find No. 063).*

**- Inv. No. F0948A.** Complete. D: 6.3 - 6.8 cm; H: 3.1 cm. Round disc with axial perforation, 1.25 cm wide *(Area I, L0266, Find No. 080).*

**- Inv. No. 1087A** (before F0924B; Fig.1:2). 11.8 x 6.8 x 4.6 cm. White. Elongated body ("axe" shaped) with a central suspended groove *(Area I, Cross section).*

## Catalogue of lead net sinkers

**- Inv. No. F0090A.** D: 2.7 cm. Incomplete ring. Lead cast *(Area II, L1001).*
**- Inv. No. F0176A.** Complete. 1.0 x 1.3-0.9 x 1.1 cm. Folded lead sheet *(Area I, L0001, Find No. 001).*
**- Inv. No. F0188A.** Complete. 1) 2.4 x 1.6-1.1 x 1.6 -1.1 cm; 2) 1.8 x 0.9 x 0.6 cm. Folded lead sheet *(Area I, L0001, Find No. 001).*
**- Inv. No. F0199A.** Complete. 1.0 x 0.7 x 0.4 cm. Folded lead sheet *(Area I, BB/43, North section).*
**- Inv. No. F0203A.** D: 2.2 cm. Ring shape. Lead cast *(Area I, L0182).*
**- Inv. No. F0303A.** Fragmentary. 1.9 x 1.8 x 1.8 cm. Folded lead sheet *(Area II, L1095).*
**- Inv. No. F0341A.** Fragmentary. 1.8 x 1.5-1.2 x 1.2 cm. Folded lead sheet *(Area I, BC/43, L0233, Find No. 025).*
**- Inv. No. F0432A.** Complete? 1.8 x 1.5-1.2 x 1.2-0.8 cm. Folded lead sheet *(Area III, BF/85, L2002, Find No. 019).*
**- Inv. No. F0466A.** Complete. 2.6 x 1.8 x 1.3 cm. Folded lead sheet *(Area I, L0001, Find No. 010).*
**- Inv. No. F0467A.** Complete. Technique: melted. 1.8 x 2.6 x 1.1 cm. Folded lead sheet *(Area I, L0001, Find No. 019).*
**- Inv. No. F0468A.** Complete. Technique: melted. 2.0 x 1.6 x 1.4 cm. Folded lead sheet *(Area I, L0001).*
**- Inv. No. F0469A.** Fragmentary. 1.7 x 2.0 x 0.6 cm. Folded lead sheet *(Area I, L0113, Find No. 209).*
**- Inv. No. F0551A.** U-shape. Folded lead sheet *(Area I, BB/43, East section).*
**- Inv. No. F0698A.** Complete. 1.4 x 2.1 x 1.9 cm. Folded lead sheet *(Area I, L0266, Find No. 072).*
**- Inv. No. F0736A.** Complete. 2.11 x 1.53 x 1.60 cm. Folded lead sheet *(Area I, L0174, Find No. 030).*
**- Inv. No. F0737A**. Complete. 2.12 x 1.38 x 1.54 cm. Folded lead sheet *(Area I, L0001, Find No. 018).*
**- Inv. No. F0740A.** Fragmentary. 1.9 x 1.7 x 2 cm. Folded lead sheet *(Area I, Square L0339, Find No. 001).*
**- Inv. No. F0746A.** Complete. Technique: melted. 1.86 x 1.73 x 1.54 cm. U-shape. Folded lead sheet *(Area I, L0001, Find No. 003).*
**- Inv. No. F0747A.** Fragmentary. 1.94 x 1.53 x 1.64 cm. UFolded lead sheet *(Area I, L0174, Find No. 174).*
**- Inv. No. F0750A.** Fragmentary. 1.84 x 1.36 x 1.20 cm. Folded lead sheet *(Surface).*
**- Inv. No. F0757A.** Fragmentary. 1.29 x 1.15 x 1.10 cm. Folded lead sheet (*Area I, L0174, Find No. 040).*
**- Inv. No. F0758A.** Fragmentary. 1.1 x 0.4 x 2.0 cm. Folded lead sheet (*Area II, Operation 38).*
**- Inv. No. F0789A.** Fragmentary. 1.70 x 1.30 x 1.42 cm. Folded lead sheet *(Area I, BB/42, L0040, Find No. 044).*
**- Inv. No. F0851A.** Complete. 1.6 x 2.05 x 1.4 cm. Folded lead sheet *(Area I, L0371, Find No. 087).*
**- Inv. No. F0853A.** Fragmentary, with rust. 1.7 x 2.1 x 1.8 cm. Folded lead sheet *(Area I, L0371, Find No. 088).*
**- Inv. No. F0859A.** Fragmentary. Folded lead sheet *(Area I, L0001).*
**- Inv. No. F0862A.** Fragmentary. Folded lead sheet *(Area I, L0352).*
**- Inv. No. F0863A.** Fragmentary. Folded lead sheet? *(Area I, L0266, Find No. 028).*

**- Inv. No. F0868A.** Fragmentary. 4.2 x 2.5 x 2.5 cm. Folded lead sheet *(Area I, L0349 Find No. 003).*
**- Inv. No. F1007A.** Fragmentary. 0.4 x 2.2 x 0.8 cm. Folded lead sheet *(Area I, L0057).*
**- Inv. No. F1008A**. Fragmentary. Folded lead sheet *(Area I, L0064).*
**- Inv. No. F1010A.** Fragmentary. 1.5 x 1.5 x 1.4 cm. Folded lead sheet *(Area I, L0008).*
**- Inv. No. F1021A.** Fragmentary. 0.8 x 2.0 cm. Folded lead sheet *(Area I, BC/42, L0001).*
**- Inv. No. F1025A**. 0.8 x 3.0x 1.7 cm. Folded lead sheet *(Area I, BC/41, L0156).*
**- Inv. No. F1036A.** Fragmentary. Folded lead sheet *(Area I, L0060).*
**- Inv. No. F1043A.** Fragmentary. Folded lead sheet *(Area I, L0046).*
**- Inv. No. F1044A.** Fragmentary. Folded lead sheet *(Area I, L0101).*
**- Inv. No. F1045A.** Fragmentary. Folded lead sheet *(Area I, L0171).*

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**Fig. 1:1**, Inv. No. F0814 (Area V, L0511)
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**Fig. 1:5**, Inv. No. F1079A (Area I, L0257)
**Fig. 1:6**, Inv. No. F0157A (Area I, L0001)
**Fig. 1:7**, Inv. No. F0941A (Area I, L0349)

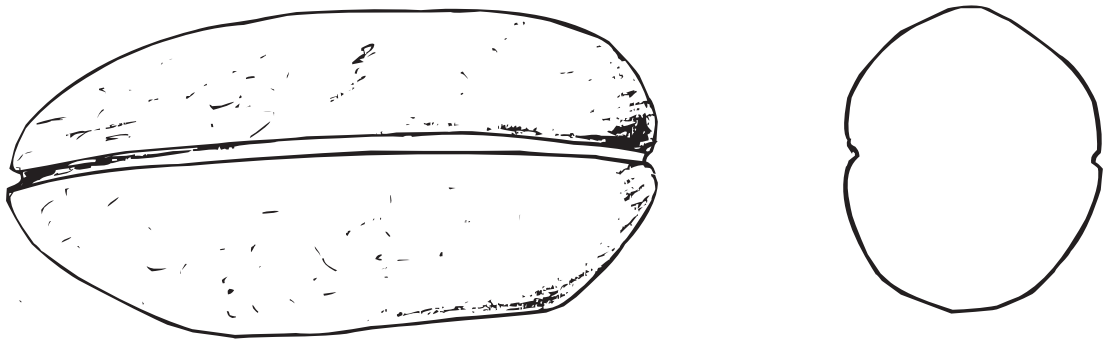

**Fig. 1:1**, Inv. No. F0814 (Area V, L0511)

0 1cm

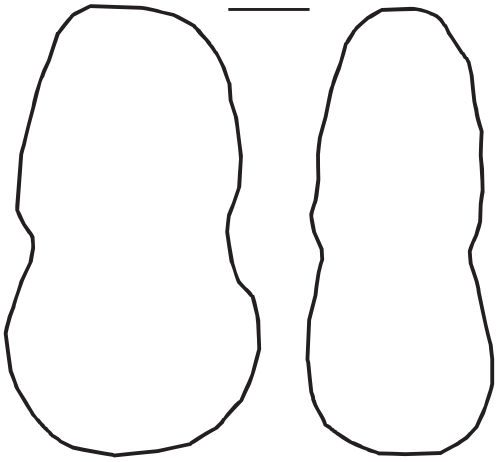

**Fig. 1:2,** Inv. No. F1087A

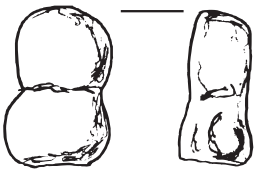

**Fig. 1:3**, Inv. No. F0473A (Area I, L0247)

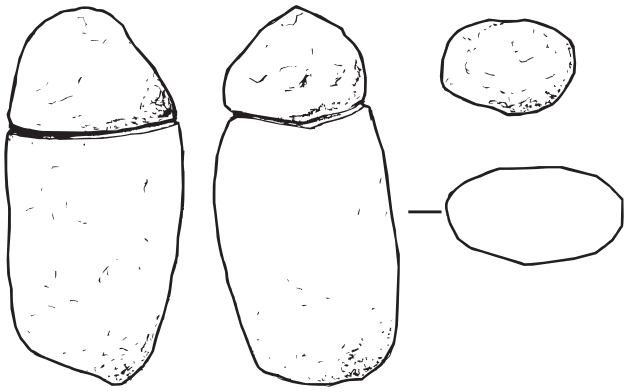

**Fig. 1:4**, Inv. No. F0875A (Area I, L360)

0 2cm

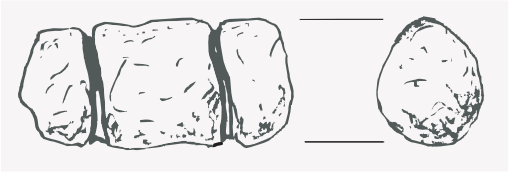

**Fig. 1:5**, Inv. No. F1079A (Area I, L0257)

0 1cm

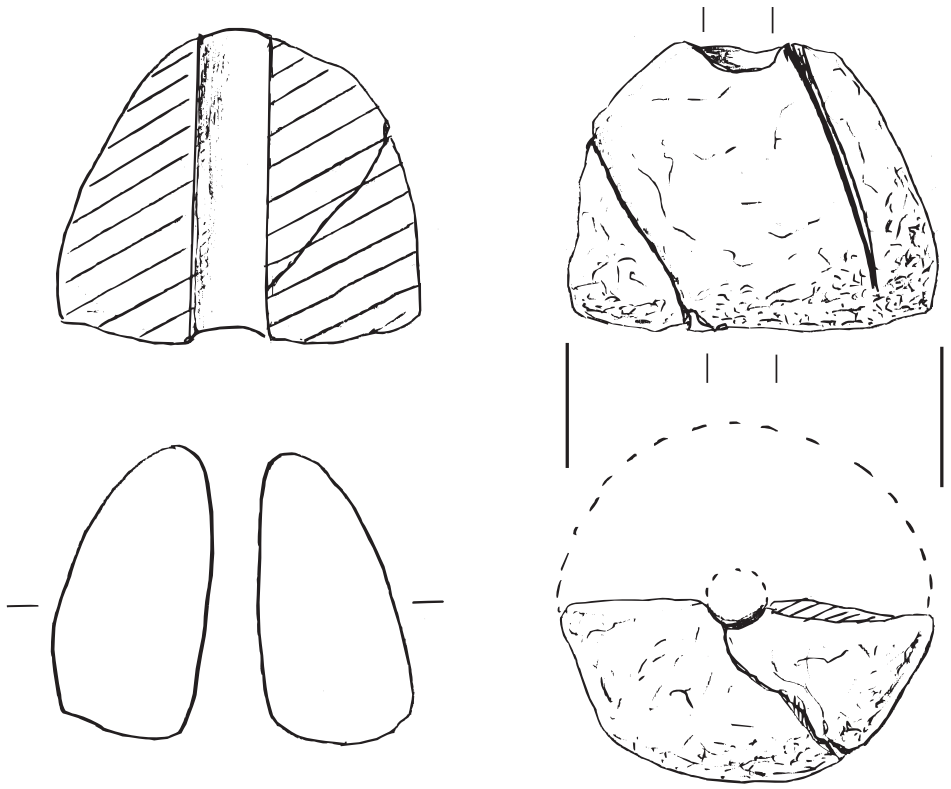

**Fig. 1:6**, Inv. No. F0157A (Area I, L0001)

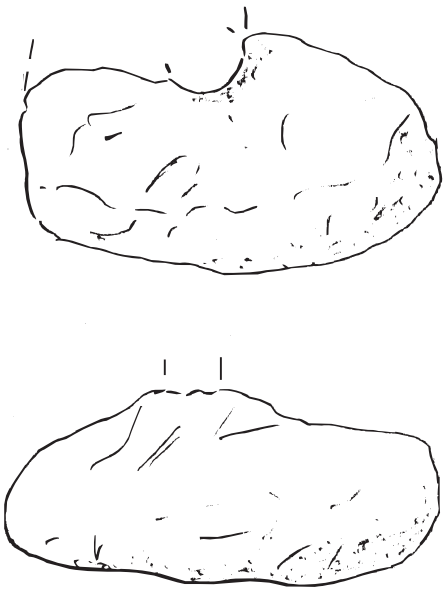

**Fig. 1:7**, Inv. No. F0941A (Area I, L0349)

0 1cm

## Abbreviations

*IAA Israel Antiquities Autority,* Tel Aviv.
*AVDAIK*: *Archäologische Veröffentlichungen, Deutsches Archaeologische Institut, Abt. Kairo*.
*BACE: Bulletin of the Australian Centre of Egyptology*, Sydney.
*BASOR: Bulletin of the American Society for Oriental Research,* New Haven.
*BCE: Bulletin de Liaison du groupe international d´étude de la céramique égyptienne*, Le Caire..
*BES: Bulletin of the Egyptological Seminar,* New York.
*CCE: Cahiers de la Céramique Égyptienne*, Le Caire.
*CRIPEL: Cahiers de Recherches de l´Institut de Papyrologie et d´Egyptologie de Lille,* Lille.
*JEA: Journal of Egyptian Archaeology*, London.
*JARCE: Journal of the American Research Center in Egypt*, Boston.
*Levant: Annual of the Council for British Research in the Levant,* London.
*MDAIK: Mitteilungen des Deutschen Archäologischen Instituts, Abt. Kairo*, Wiesbaden – Mainz.
*REE: Revista de Estudios de Egiptología,* Buenos Aires.
*RUNA: Archivo para las Ciencias del Hombre,* Buenos Aires.
SAGA*: Studien zur Archäologie und Geschichte Altägyptens*, Heidelberger.
*Tel Aviv: Journal of the Institute of Archaeology, Tel Aviv University*, Tel Aviv.

# TELL EL-GHABA II

## Addenda to Tell el-Ghaba I

# ADDENDA TO TELL EL-GHABA I*

# PART I: AREA I

## LEVEL I: Strata below Building A and Structure G
## L0112

**1.- Stratigraphy:** virgin soil. Sandy clay, wet and so much plastic that it can not be sieved. Maybe a succession of eolic and lacustrine sediments since there is lamination at certain depths, and this lamination is not associated to human activity.[1]

**2.- Archaeological material**

***Pottery***

**a) Egyptian pottery, Nile silt clay, *household ware***

**No. 1: bowl**, Inv. No. C-1005 [002]

| Uncoated | Nile $B_2/E_1$ | $W_2$ |
|---|---|---|

Rim sherd; everted direct rim. Rd: 28.00 cm 7/5; Wd: 0.75 cm; $H_1$: 2.00 + x cm; throwing lines inside; smoothed on the wheel.

**Body sherds**: Nile $B_2$, Nile $B_2$ v.s., Nile $C_2$, Nile $E_1$.

**b) Imported pottery**

***Levantine household ware,* body sherds:** IV.TG 01 and IV.TG 27.

***Cypriote household ware*, body sherds:** VI.TG 04.

## L0370

**1.- Stratigraphy:** a hearth, 120 cm wide.[2]

**2.- Archaeological material (Fig. 1)**

**Egyptian pottery, Nile silt clay, *household ware***

**No. 1: bowl**, Inv. No. C-0666 [001]

| Uncoated | Nile $B_2$ | $W_2$ |
|---|---|---|

Rim sherd; carinated walls, inverted direct rim. Rd: 16.00 cm 3/32; Wd: 0.74 cm; $H_1$: 2.89 + x cm. Throwing lines inside; smoothed on the wheel.

**Egyptian marls, *household ware***

**No. 2: jar (or amphora?)** (Fig. 1), Inv. No. C-0666 [002]

| Uncoated | Marl F | $W_2$ |
|---|---|---|

Rim sherd; everted direct rim. Rd: 8.00 cm 3/4; Wd: 0.57 cm; $H_1$: 3.55 + x cm. Throwing lines inside; smoothed on the wheel.

**Body sherds**: Nile $B_2$.

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**Notes**

* In these Addenda the archaeological material from five loci not included in *Tell el-Ghaba I* is published.

[1] From *Tell el-Ghaba I*, p. 79.

[2] From *Tell el-Ghaba I*, p. 79.

# L0375 North-eastern section

**1.- Stratigraphy:** natural fill very rich in clay.[3]
**2.- Archaeological material**
**Egyptian pottery, Nile silt clay**
***Household ware***
**No. 1: jar**, Inv. No. C-0629 [004]

| Uncoated | Nile $B_2$ | $W_2$ |
|---|---|---|

Rim sherd; everted direct rim. Rd: 10.00 cm 1/8; Wd: 0.50 cm; $H_1$: 2.25 + x cm. Throwing lines inside; smoothed on the wheel; eroded.

**No. 2: jar**, Inv. No. C-0629 [002]

| Uncoated | Nile $B_2$ | $W_2$ |
|---|---|---|

Rim sherd; inverted articulated interior rim, round lip. Rd: 14.00 cm 1/8; Wd: 0.70 cm; $H_1$: 4.20 + x cm. Throwing lines inside; smoothed on the wheel; eroded.

**No. 3: jar**, Inv. No. C-0629 [003]

| Uncoated | Nile $B_2$ | $W_2$ |
|---|---|---|

Rim sherd; vertical articulated interior and exterior rim, modeled lip. Rd: 14.00 cm 3/32; Wd: 0.65 cm; $H_1$: 4.00 + x cm. Throwing lines inside; smoothed on the wheel; eroded.

**No. 4: jar**, Inv. No. C-0629 [001]

| Uncoated | Nile $E_2$ | $W_2$ | W |
|---|---|---|---|

Base (flat) fragment. Bd: 6.00 cm; Wd: 0.80 cm; $H_1$: 2.70 + x cm. Throwing lines inside; smoothed on the wheel.

**No. 5: storage jar**, Inv. No. C-0629 [006]

| Uncoated | Nile $B_2$ | $W_2$ |
|---|---|---|

Rim sherd; inverted articulated interior and exterior rim, folded lip. Rd: 28.00 cm 1/8; Wd: 0.90 cm; $H_1$: 5.40 + x cm. Throwing lines inside; smoothed on the wheel;

**No. 6: storage jar**, Inv. No. C-0629 [007]

| Uncoated | Nile $B_2$ | $Ha_2$ |
|---|---|---|

Handle fragment; Hd: 3.85 x 2.75 cm; burnt and eroded.

***Pottery with special functions***
**No. 7: lid**, Inv. No. C-0629 [005]

| Uncoated | Nile $B_2$ | $W_2$ |
|---|---|---|

Rim sherd; everted direct rim. Rd: 22.00 cm 3/32; Wd: 0.55 cm; $H_1$: 1.80 + x cm. Throwing lines inside; smoothed on the wheel; eroded.

**Body sherds**: Nile $B_2$.

[3] From *Tell el-Ghaba I*, p. 203.

# PART III: AREA VI

## LEVEL I: Pre-Building F
## L0548

**1.-Description:** Sandy clay with ash and shallow charcoal lenses, perhaps dispersed by human frequentation. The charcoals are very fragile. Human frequentation.[4]

**2.-Archaeological material**

**Egyptian pottery, Nile silt clay, body sherds**, Nile $B_2$.

## LEVEL III: Post-Building F
## L0505

**1.-Description**: a sedimentary lens very rich in fish bones. Small midden.[5]

**2.-Archaeological material (Fig. 2)**

**a) Egyptian pottery, Nile silt clay**

***Fine ware, Egyptian painted ware*, *Black on Red slip ware***

**No. 1: barrel-shaped jug** (Fig. 2), Inv. No. P1166A (Drawing No. 0643)

| | | | | | |
|---|---|---|---|---|---|
| RPMO | Nile $B_2$ | $W_2$ | --- | re. | 2-3 |

Body fragments (six fragments); mended. Nd: 4.50 cm; Wd: 0.50-0.60cm; $H_1$: 2.50-3.50 + x cm. 2.5YR 5/6 red slip. Break: 5YR 5/1 grey core; 5YR 4/1 dark grey exterior zones. Body made in two halves, which are then joined. Decoration: three concentric painted circles on the body, 3 mm wide, 5YR 4/1 dark grey. Polished, medium lustre.

***Household ware***

**No. 2: bowl**, Inv. No. C-6008 [004]

| | | |
|---|---|---|
| Uncoated | Nile $B_2$ | $W_2$ |

Rim sherd (3/32); everted direct rim. Rd: 19.00 cm; Wd: 0.60 cm; $H_1$: 3.50 + x cm; smoothed on the wheel. Rd: 20.00cm

**No. 4: juglet**, Inv. No. C-6008 [001]

| | | |
|---|---|---|
| Uncoated | Nile $E_2$ | $W_2 + Ha_2$ |

Shoulder and handle fragment; Md: 11.00 + x cm; Wd: 0.40 cm; $H_1$: 4.00 + x cm; Hd: 1.80 x 1.00 cm. Made in parts; throwing lines inside; smoothed surface. Another: a fragment near the base.

**No. 5: jar**, Inv. No. C-6008 [007]

| | | |
|---|---|---|
| Uncoated | Nile $B_2$ | $W_2$ |

Rim sherd (1/32); everted direct rim. Rd: 14.00 cm; Wd: 0.50 cm; $H_1$: 2.50 + x cm; throwing lines inside; smoothed on the wheel.

**No. 6: jar**, Inv. No. C-6008 [003]

| | | |
|---|---|---|
| Uncoated | Nile $B_2$ | $W_2$ |

Rim sherd (1/8); vertical direct rim. Rd: 10.00cm; Wd: 0.60 cm; $H_1$: 3,20 cm; made in parts; throwing lines inside; smoothed on the wheel.

**No. 7: storage jar**, Inv. No. C-6008 [006]

[4] From *Tell el-Ghaba I*, p. 345.

[5] From *Tell el-Ghaba I*, p. 362.

| Uncoated | Nile $B_2$ | $W_2$ | W |
|---|---|---|---|

Base (rounded) fragment. Md: 14.00 + x cm. Wd: 1.00 cm; $H_1$: 5.50 + x cm; made in parts; throwing lines inside, finger prints inside; smoothed on the wheel.

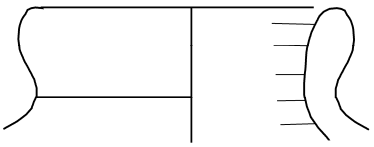
***Pottery with special functions***

**No. 8: lid**, Inv. No. C-6008 [002]

| Uncoated | Nile $B_2$ | $W_2$ |
|---|---|---|

Rim sherd (3/64); everted direct rim. Rd: 24.00 cm; Wd: 1.00 cm; $H_1$: 4.50 + x cm; throwing lines inside; smoothed on the wheel.

**Body sherds**, Nile $B_2$, Marl $A_4$, Marl F.

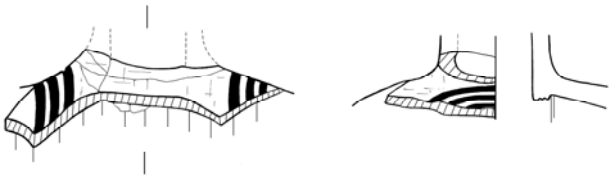


No. 2 C-0666 [002]

0 2cm

AREA I, L0370

Fig. 1



No. 1 P1166A

0 3cm

AREA VI, L0505

Fig. 2